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SEPTEMBER 1992

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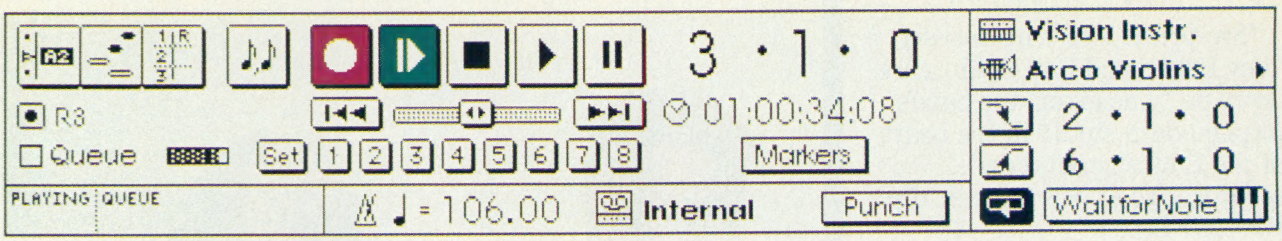

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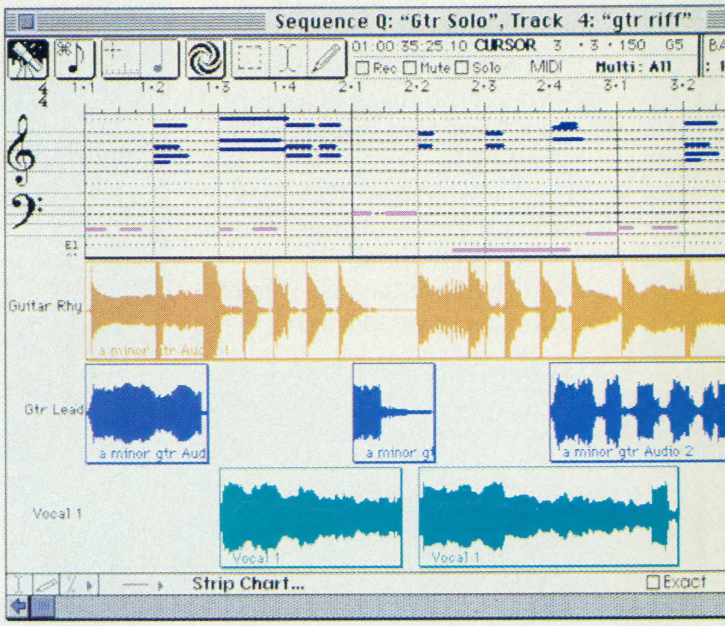

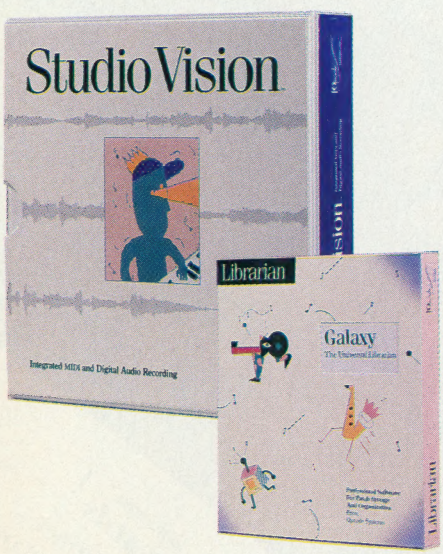

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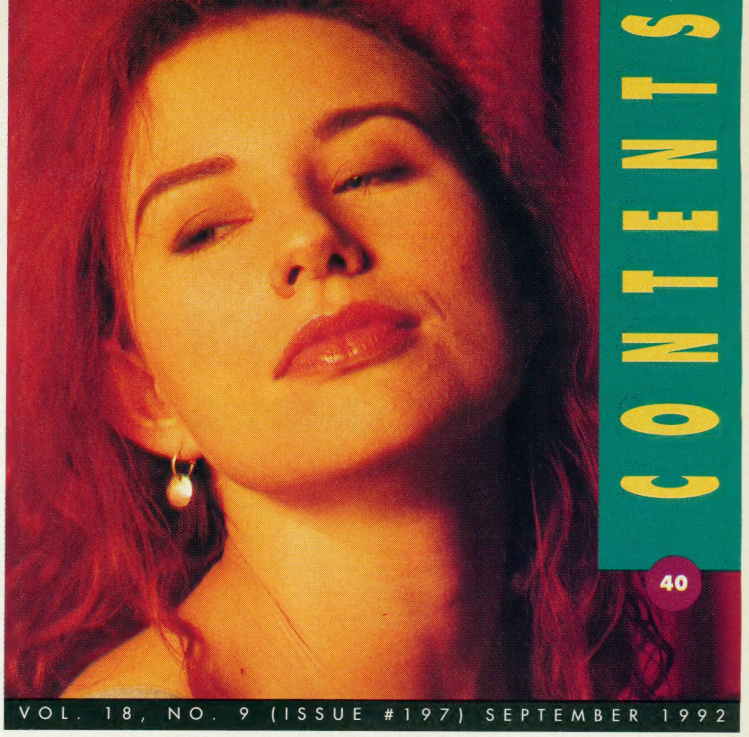

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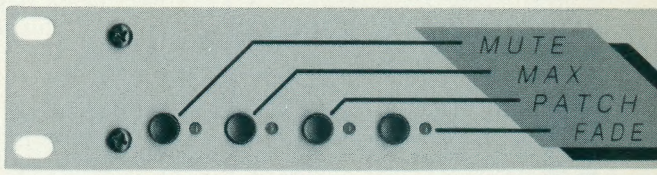

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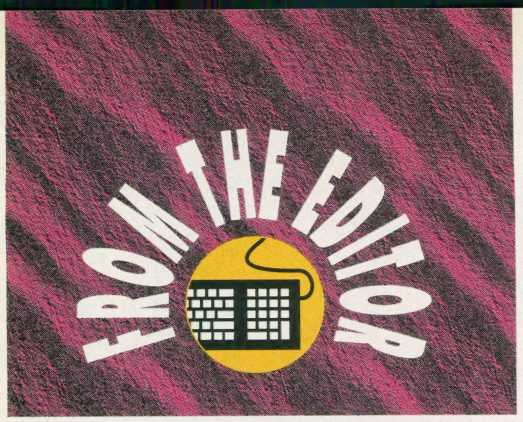

DOMINIC MILANO

THE DEAD PRESIDENTS SPEAK

IT WAS FRIGHTENING. MARK VAIL and I were minding our own business, discussing the methodology of the spec tests for this month's review of JL Cooper's Mix Master, when through the floor came the thump thump thump of someone obviously playing drums on the floor in the room behind us. In one lightening-fast motion, Vail scooped up his phone and inquired as to what, as they say, was up. "I've always been a better drummer than a bassist," was the reply, muffled by the wall separating us from the source of this unruly disturbance. "Desist! Or we'll torture you with our rendition of the drum solo to 'In-A-Gadda-Da-Vida,'" Mark threatened (you see, all *Keyboard* editorial staffers are well-trained in the art of intimidation). Without another word, using the plasterboard as our trap kit, the two of us launched into the solo. We made it through the first few bars in perfect unison before stopping dead, again as if synced via SMPTE, to stare at each other in wide-eyed disbelief. Something was drastically amiss.

Just then, Greg Rule burst into the room, slaying us with a vicious glare full of accusations. "I knew it. You guys are nothing but a couple of closet drummers. Another word about my being a real drummer and the jig is up. I'll tell the world your rueful secret." Heh heh. Rule was too young to get it. The scandal wasn't that two self-respecting keyboardists knew the drum solo to a 20-year-old anthem of psychedelia, it was that Vail and I were old enough to remember, note-for-note, the drum solo to a tune that came out when Rule was two years old.

We've become old farts.

This wasn't exactly news to me. I'd had a few warnings in recent weeks. . . . The first was a call from Bob Moog asking me if I could provide him with a list of people doing interesting things with MIDI technology. When I started naming people, he stopped me. "No, Dom. Those guys aren't young enough. We're looking for players in their twenties." As I opened my electronic Rolodex, I started to get worried. Page after page was filled with folks more my age — your basic thirtysomething. "Bob, these guys are all old." "Dominic," he replied. "That's because *you're* old."

A day later, Bob was on the line again. Seems Keiichi Goto and Teiichi Takenaka were producing a ten-volume video series on MIDI for BMG Victor (thus the request for people doing interesting things with MIDI). Bob asked if I would care to be part of a panel discussion with Bob, Dave Smith, Tom Oberheim, and Roger Linn.

During the taping, Keiichi jokingly referred to us as "history." Moog, Smith, Oberheim, and Linn had another name for themselves — the Dead Presidents. So there I was, "history," and getting invited to future meetings of the Dead Presidents Club, feeling truly antique, participating in an absolutely fascinating discussion about the state of our industry, the history of MIDI, the first polyphonic synthesizers, computers and software, drum machines, wavetable synths, instrument design. . . . And eventually some of us old farts speculated that the stalled state of our industry was in part due to the fact that instruments have been designed too well over the last 25 years. Designers — including the guys sitting around the room with me — built instruments that made it too easy to make good-sounding music. Instruments that took just enough of the challenge out of making music and designing synth sounds to turn off through sheer boredom a lot of potential synthesists, much as the home organ industry built itself into oblivion with all their autochord and auto-accompaniment gizmos. It was a speculation that this old fart found particularly interesting, given the apparent rebirth of interest in playing the piano that I see happening almost everywhere — from the piano-filled Tori Amos sort of debut CD (the subject of this month's cover story) to the new Dregs live reunion album featuring the most burning piano playing I've ever heard from T Lavitz.

Anyway, it's interesting food for thought from the Dead Presidents and a thirtysomething old fart.

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Affordable Digital Recording

Your feature on affordable digital recording [July '92] displayed an overly cutesy, space-wasting writing style, as well as incomplete and advertiser-biased coverage. Specifically, your readers were denied information about a truly affordable and quite powerful DOS-based system. Micro Technology Unlimited, a small firm in Raleigh, NC, has been in the D-to-D business since 1979.

After a more complete survey of the field than yours, I invested in the MTU system for three primary reasons: (1) Sound quality supporting a better-than-DAT 110dB noise floor. (2) Digital mixing of over 30 separate sound files. (3) Cost. I was able to purchase an entire digital system, including a pro DAT recorder, a 486/33MHz computer, a 1.2 gigabyte hard drive (1-1/2 hours of stereo track time), and the MTU hardware and software, for a bit over $10,000.

Frank McCarty
Soundlib Studio
Greensboro, NC

When comparing IBM and compatible platforms, Marans advises that "processor speed is everything" in digital recording applications. To support this statement, he advises that a 386/33MHz system is preferable to a 486/25MHz system due to the higher CPU speed. In fact, studies have shown that a 486/25MHz CPU's performance exceeds that of a 386/33MHz by 20 to 30 percent. The 486 CPU is capable of performing the same operations in fewer clock cycles, which renders any straight comparison of clock rates between 386 and 486 CPUs incongruent. Perhaps Marans should advise his readers to consider a system's processing *power*. The reader should also be aware that a CPU's clock rate is only a single component in determining a system's processing power. It is true that a coprocessor does not contribute to this application, and the benchmarks performed to evaluate 386 vs. 486 performance exclude coprocessor operations to provide a balanced comparison. The best advice is really to invest in a system that can upgrade to better processors as they become available.

H. E. Vail
Raleigh, NC

Michael Marans uses the word "monophonic" twice in the following passage from his article on digital recording: "A discrete track is actually a hardware audio channel that's dedicated to playing back a single, monophonic audio signal. A two-track system, then, provides two discrete channels through which signals may pass. These signals can be two completely unrelated monophonic signals, or the left and right sides of a stereo signal." Shouldn't that be *monaural*? Many's the time I've used a two-track machine to record two discrete tracks of *monaural polyphonic* audio, whereas "monophonic" conjures images of the separate outputs on my 12-bit sampler. Know what I mean?

Jon Chappell
Rye, NY

A statement from your article is potentially misleading on the relative cost of hard-disk recording systems, in particular the cost of New England Digital systems. I refer to page 68, where it is stated, "The only other alternative was the New England Digital Synclavier with the Direct-to-Disk option — the first commercially available multitrack hard-disk-based recording system. (We don't have enough space on the page to print all the zeroes in its price tag.)" The truth is that fully functional NED workstations start at under $80,000 — no more zeroes than the $30,000 "affordable" system you refer to in the next paragraph.

Many professional digital audio workstations can cost upwards of the $150,000 you refer to for a typical pro system, but the reasons for the price differential relate to functionality. Most of the points referred to throughout the article — computer speed, disk size, number of tracks, synchronization, backup, etc. — are exactly the factors that differentiate pro systems from their less expensive counterparts. Not all hard-disk recorders are designed for the same applications, no more than all tape recorders, consoles, or other pieces of equipment are.

Regardless, it is simply inaccurate to represent New England Digital products as unreasonably expensive. This is not, and has never been, the case.

Darren W. Abrams
New England Digital
Lebanon, NH

Missed by *That* Much

[*Our Affordable Digital Recording issue had barely hit the newsstands when we got two phone calls, one from Alesis and the other from Tascam. Both calls were about the same subject: The information we had printed regarding the tape wrap on the Alesis ADAT and on Tascam's as-yet-unnamed digital recorder was partially incorrect. When we stated that the 8mm technology used by Tascam's machine "only requires that the tape wrap 180° around the rotating head," we implied — erroneously — that the tape wrap on the VHS-based ADAT was greater than 180°. In fact, both VHS and 8mm technologies use a 180° wrap. Consequently, any differences in the speed of the machines' respective transports would be the result of transport design, not tape format or head wrap.*

[We also said that the head on the ADAT spun at twice normal speed. In fact, although the head spins faster than normal, it is not twice normal speed. The tape, on the other hand, travels at three times the speed used on a standard VHS machine.

[We're sorry for the confusion, but we have a good excuse: Our original information came from, that's right, Alesis and Tascam. Guess it's hard to keep up on all the technological developments — even when you're creating them.]

Ensoniq DP/4

We were very pleased to receive coverage of our DP/4 digital effects processor [Keyboard Report, July '92]. There is, however, one technical point that we need to clear up. The review states that the THD+n measurement at 1kHz was .05%. Our measured figure is .005%, which is significantly better. After discussing the test methodology with Michael Marans, we found the reasons for this discrepancy. They fall into two categories: testing methodologies and differences in test equipment.

As is common practice with all A/D and D/A converter manufacturers, we measure our THD+n at a level somewhat below maximum signal (below clipping) because the average level of signals that pass through the components is lower than the peak signals. It is accepted practice to be sure that the average level when mastering a CD is -14dB; this allows enough headroom for the peak signals. Most components we purchase come with specifications measured at 0dB, -20dB, and -60dB, because these lower level measurements are the most important consideration when determining distortion in a digital system.

Because of this fact, and because of the design of the DP/4, we measure our THD+n at -12dB relative to the clip point of our system. We mentioned this to *Keyboard*, who also measured at this level but did not compensate for this lower level by adding back in the 12dB. If you don't add back the 12dB or tell people where the measurement was taken relative to the clip point of the system, then the reader has no reference point to evaluate that data. Is it -12dB, -60dB, or not lowered at all?

To make this easier to understand, if you have one recording that has been mastered at -10dB and another that was mastered at -20dB, when you play them on a system you'll adjust the first recording to sound as loud as possible

without clipping the peak passages. When you play the second recording (which is lower in volume) on your system, your natural reaction will be to turn up the volume slightly, without clipping the peak passages. It doesn't matter at what lower level the recording was mastered; you will compensate for it by bringing the volume back up to just below clipping. This is what you achieve in testing when you add back in whatever level by which you originally reduced your system, so you end up with a full level reference that can be considered a standard across all devices and applications.

Regarding the test equipment, the Audio Precision that both we and Marans used has slots inside to accommodate additional filtering. These filters are commonly used to eliminate inaudible high frequency signals, which will give artificially high noise and distortion measurements, based on signals that listeners will never hear (as *Keyboard* accurately stated). In testing for distortion, it is imperative that the test equipment employ filtering to band-limit the signal properly. All ten of the Audio Precision units we have in our engineering and production department have 20kHz, five-pole filters to give us accurate readings. The *Keyboard* Audio Precision has 22kHz band-limiting filters. The difference between these filters contributes to the presence in the *Keyboard* tests of these "whopping" high distortion figures.

So by not adding back the 12dB, and due to the presence of the out-of-band (above 20kHz) signal, *Keyboard* got results that differ from ours. We stand by our measured spec of .005% THD+n, and assure your readers that every channel of every DP/4 that we build is tested with an Audio Precision with this 20kHz filter to guarantee that they meet our spec. As *Keyboard* states, the bottom line is the sound; testing is a complicated process that can sometimes produce different data, depending on the testing methods.

Jerry Kovarsky
Director of Marketing,
Musical Instruments
Ensoniq
Malvern, PA

Keith Emerson

Many thanks to Robert L. Doerschuk for the fantastic job he did in interviewing Keith Emerson [June '92], a true living legend. He asked all the right questions and then some. By the way, the bottle referred to as a wine bottle in the photo on page 53 is in fact a bottle of brandy. I remember seeing Emerson with the same type of bottle in another old photograph, taking what looked like a healthy swig with a stunning blonde at his side. We older fans of ELP remember these things, and I bet Keith would remember as well.

K. W. Rosell
Black Mountain, NC

I was very happy to learn, through your excellent magazine, that Emerson, Lake & Palmer will soon be on tour again. This is a special event for me, since I grew up reading Jonathan Swift and listening to ELP. I know all of Swift's works, and practically all of Emerson's music, from the Nice down to this year's reunion. Though I'm very busy right now, working on a biography of Swift that includes textual collation of 18th-century editions and manuscripts, it is very important for me to catch one of ELP's concerts; to finally see them play, for the first time in my life, means a lot to me. I certainly hope that Emerson can learn, through the pages of *Keyboard*, that there is a Jonathan Swift scholar working as a doctoral student at the University of Southern Mississippi who considers him one of the best musicians of this century.

Jaoa Froes
Hattiesburg, MI

With stories like your June '92 Emerson interview, you'll have me as a subscriber for many years to come. As a matter of fact, my whole reason for subscribing to *Keyboard* was your Apr. '88 story on K.E., whom I regard as possibly the best keyboardist and composer of our time. Indeed, I have four pictures on the wall over my keyboard rig, complete with track lights to illuminate them: Bach, Mozart, Tchaikovsky — and Emerson. Thanks for keeping ELP in the spotlight.

Rick Jones
Ft. Lauderdale, FL

Did you know that Elvis was Keith's favorite vocal artist?

Mike Masterton
London, England

Easy Interfaces

In his From The Editor column [June '92], Dominic Milano overlooked the one synth between the Prophet-5 and the DX7 that helped introduce the music world to the concept of single parameter editing with a data slider: the Korg Poly-61. To my knowledge, this was the first synth to give you two oscillators, memory, and a price tag below $2,000. It also gave you two LED readouts and a couple of editing buttons for programming — and, unfortunately, that was it. When the time came for me, a young and financially strapped synth player, to choose between the Poly-61 and the Roland Juno-60, I didn't care that the Poly-61 had two oscillators, but I did care that the Juno-60 had buttons and sliders, which made it much more user-friendly; there was nothing like being able to adjust the cutoff frequency and the resonance at the same time. The point, with regard to Dominic's article, is that some keyboardists function like electricity: They choose the path of least resistance.

Matt Young
Buffalo, NY

PowerBooks vs. MIDI

The June '92 issue of *Keyboard* has a well-written Computers On-Line column by Geoffrey Ryle on using the Macintosh PowerBook and its problems with MIDI. The problem occurs when one is transferring large amounts of MIDI data *to* a PowerBook. There is no problem when transferring large amounts of data *from* a PowerBook. Data such as polyphonic aftertouch and pitch-bend — the usual culprits, as they consume large amounts of data — do not cause a problem. The problem occurs when one performs system-exclusive functions, such as dumping banks of data or samples (samples are usually much larger than any bank of patches) to a PowerBook.

One way to get around the problem of not being able to send banks of patches to a PowerBook is to simply send banks one patch at a time. At home, you can still easily transfer

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Send correspondence to: Letters, Keyboard, *20085 Stevens Creek, Cupertino, CA 95014.*

your banks, samples, and sequences to your PowerBook via floppy, SCSI disk mode, or Personal AppleShare. Then, once in the remote location — recording studio, onstage, etc. — with your PowerBook, you will be able to send patches, banks, samples, and sequences to any MIDI device with no problems. Clearly, these are interim solutions, but they do show that many PowerBook MIDI users can still get a great deal of functionality from their setups for the time being.

Ryle solved the missing files problem by using Tuner 1.1.1 with his Mac. Remember to always use Tuner 1.1.1 with Systems 7.0 and 7.0.1 to ensure optimum performance and to avoid any missing files problems. Before adding Tuner 1.1.1, it is advisable to back up your hard-disk-based data, initialize the disk using Apple HD SC Setup (use "Maximum Macintosh" in most cases), install or restore your system software, drop Tuner into your system folder, and then restore your data. This is also a risk-free way to optimize your hard disk.

Apple is now working on a fix to the PowerBook MIDI problem.

Derek Kueter
Greg Gretsch
Apple Computer
Cupertino, CA

Bombshells at CyberArts

[*Our Mar. '92 article on the CyberArts conference co-sponsored by* Keyboard *and staged last November has precipitated a strong, if somewhat tardy, outcry. The problem stems from writer Linda Jacobson's description of a Virtual Audio demonstration of 3D sound. "It's led by scantily clad, high-heeled blond women," she noted, "underscoring the fact that this newly forming cyberfield is populated mostly by guys." Later, Jacobson described a part of the demonstration, in which blindfolded audience members were treated to "the sound of someone opening and drinking a soda beside your head. I remove the blindfold to watch other participants' reactions. I see the man across from me. Under his nose the demo hostess is holding a paper cup — full of cola, no doubt. Seeing me, she grins and gestures, 'shhh!' Beneath his blindfold, the guy smiles like Mona Lisa." Here's how one observer, and two participants, in the Virtual Audio presentation, respond to Jacobson's report.*]

I had a good laugh reading your reference to "scantily clad, high-heeled blond women." First, how do we define "scantily clad"? Are we talking about tiny G-string bikini bathing suits? Trashy lingerie? Far from it. The hostesses wore classic black velvet knee-length dresses. And, as I recall it, only two of the six ladies present were blonde. Further, I appreciated the intelligent and articulate way in which these women assisted with the Virtual Audio demonstrations.

Your assertion that "this newly forming cyberfield is populated by mostly guys" is unfounded. What ever happened to the old-fashioned concept of unbiased reporting? Or is the role of the reporter these days to editorialize with a chip on the shoulder and a sexist axe to grind? I read *Keyboard* to get information affecting vital career decisions, not to help this particular reporter exorcize personal demons.

I was taken aback by the snide innuendos of the last paragraph. "Full of cola *no doubt*" shows the reporter only speculating on what was in the cup, not reporting objectively. Believe me, Virtual Audio stands on its own and needs no props. Can it be that your reporter can't take a joke? This demonstration was the most professional and best organized of the whole show. The hundreds of people who stood hours in line and experienced Virtual Audio had better things to do than to quibble over a joke from a punchy hostess or take seriously a reporter's Victorian slant on fashion.

I'll make a deal with you. I'll promise not to cancel my subscription if you promise to send your reporter back to school to learn what journalism is all about.

Tasmin Thomas
Woodland Hills, CA

I am a banking industry professional who was described by writer Linda Jacobson as one of a group of "scantily clad, high-heeled, blond women" in your CyberArts article. I was very proud to be a part of such a fascinating Virtual Audio production, so I must say that it is awfully pathetic that a woman like Jacobson could be so catty. Her article states that during one of the demos, she heard a sound of someone opening a can of soda and drinking it. At that point, she writes, she removed her blindfold and saw one of the assistants place a paper cup filled with soda under the nose of a man who was directly across from her. The way in which she stated this created the impression that we were falsifying the demo, but this was not in fact a part of the presentation. The girls just did it for fun; little did they know that the reporter from Hell would blow it all out of proportion. It's really sad that someone in Jacobson's profession can write such a horrible article. I suggest that she get her facts straight and watch what she says about other people. What goes around will come around in the long run.

Tracy Christman
Agoura Hills, CA

It seems that years of hard work and technical achievement, from a collaboration of professional people spanning three countries around the world, have been completely overlooked for the sake of a frustrated feminist's opinion. Indeed, when I confronted the writer about her comments, she told me that I was ignorant to the degradation of women. The ladies who helped us with CyberArts are a group of professionals consisting of a lawyer, a financial advisor, a writer, an executive assistant, a sales clerk, and two professional actresses. Only two out of the seven happened to be blond. The dresses they wore were collectively picked by the ladies themselves.

Regarding the unprofessional innuendo in your closing statements about Virtual Audio, I resent the fact that *Keyboard* would imply that our technology needs covert action to help convince people. Printing this statement was completely irresponsible. The man described by Jacobson was one of our own employees. Virtual Audio had already closed the exhibit and was giving a last impromptu demo to some of the convention staff members who were unable to check out our technology during the show. Jacobson knew that this was a joke and not part of our normal procedure. Again, I confronted the writer on this subject. I was told that she writes what she sees and didn't have to write about us at all.

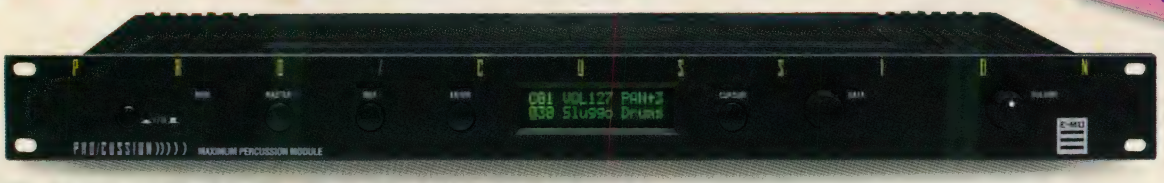
All of us who are struggling in the VA scene know how hard it's going to be to see our vision become a reality. There is a fine line to walk with the press. We need people to be informed and to understand what we are trying to achieve, yet too much hype or inaccurate reporting could ruin our vision before we really get started. If inaccurate reporting and implications of fraud are what we can expect from your magazine, then *Keyboard* writers will not be welcome in our exhibits in the future.

Richard E. McDonald
Virtual Audio Systems
Westlake Village, CA

[*Linda Jacobson responds: "Hey, I started life as a scantily clad blonde! But seriously, when Dominic asked me to review CyberArts, we knew I couldn't be 100 percent objective because I helped with the conference's prodution. I decided to pen a series of vignettes. The anecdote preceding Virtual Audio's vignette described my difficulties as a panel moderator, which established my viewpoint as that of a biased observer. Richard and other key Virtual Audio staffers knew who I was when I visited their exhibit. It appears they didn't know two others in my group: Apple Computer's Joy Mountford and JBL's Floyd Toole, two respected technologists, neither a 'convention staff member.' It was natural for me to want to see their reactions. My mention that the 'hostess' held soda under another person's nose is no impli-*

Continued on page 64

The Keyboardist's Drum Module that's Good Enough for Chester.



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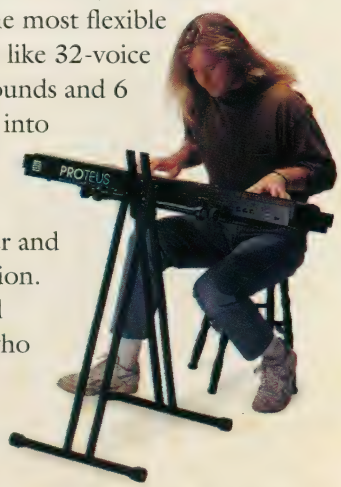

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GUEST EDITORIAL

BOB MOOG

WHO'S NOT SUPPORTING WHOM?

TWO YEARS AGO HERE IN NORTH Carolina, Harvey Gantt was running for the U.S. Senate against incumbent Jesse Helms. It was a heated campaign, with Helms, perhaps the most reactionary senator ever, accusing Gantt of favoring minorities, welfare cheaters, gays, and immoral musicians and artists at the expense of the moral white majority. Those of us who had Gantt bumper stickers on our cars could depend on hearing nasty remarks from some of our fellow citizens.

One day back then, I was filling the tank of my Toyota when another customer at the gas station came up to me and asked, "Why is it that all you Gantt people have Jap cars?" For an instant, the question made no sense to me, so I said to him, "I give up. Why is it that all us Gantt people have Jap cars?" With steam coming out of his ears, he sputtered, "Well, you're all so goddamn patriotic!" Then he turned, bolted to his shiny new Chevy, slammed the door, and varoomed off in a cloud of smoke.

If my mind was quicker, I could have told him why I have a "Jap" car. Since 1950 I'd been trying to buy a small, well-made car — one in which the gas mileage was good, the doors didn't leak, and the frequency-of-repair records were favorable. Such cars were simply not made in the United States. From my perspective it appeared that Detroit was so busy building land-going versions of the Queen Mary, changing model years, fighting with their unions, voting themselves obscene salaries, and making sure that their stockholders got their dividends every quarter, that they did not have time to find out what kinds of cars people like me wanted. And the automotive unions seemed to be too busy negotiating big fat wage and benefit packages for their members to worry about the unseemly number of "Monday cars" (*i.e.*, lemons) that were populating the highways of our country.

So I did what any good patriotic American would do. Believing in the free enterprise system and in the benefits of vigorous competition, I did the only thing that made sense — I bought a superior competitive product, one that met my needs. That, I thought, would certainly help stimulate some action in the marketing departments of the Detroit establishment. That's how progress happens in a free market. Companies that are truly customer-oriented thrive, and the less able companies — those that are burdened with inflexible or incompetent management . . . well, too bad, that's how our system works.

During the past two decades, millions of Americans like me have opted for Japanese cars, and Detroit is beginning to get the message. American cars being made today are smaller, more reliable, and more fuel-efficient than the wheeled dream-boats of the '50s and '60s. Our free market system is working. In the meantime, I have my Toyota, which still gets 35 miles per gallon and runs like a top after seven years, and has cost me a total of $200 in repair bills. It's all part of our capitalist system; my car is an ongoing reminder to Detroit of what they have to do in order to get my business.

That's what I would have told the man with the Chevy at the gas station — if my mind had been quicker.

I remembered that gas station incident when I read Richard Marshall's letter in the June '92 issue of *Keyboard*. Like my Chevy-driver acquaintance, Marshall was off on a be-patriotic-and-buy-American rant. Marshall's nuggets of protectionist wisdom rang familiar: "Every time we purchase an instrument, we vote with our wallet, either to keep our neighbors employed and off welfare or to fill the bank accounts of those wonderful people who brought us Pearl Harbor. Going out of one's way to buy American is neither paranoid nor racist, as some have accused, but rather economic common sense," intoned Marshall, as if his logic were irrefutable.

Well, I, for one, don't buy any of this patriotism-through-purchase logic. I'll tell you why, from the perspective of a person who has been deep in the electronic musical instrument business for nearly 30 years.

Under the free market system, which is certainly a cornerstone of American capitalism, producers are free to make and sell any products they choose, and consumers are free to buy any products they choose. Under this system, producers who offer desirable products at the right prices thrive, and those who don't must either improve their products' desirability or fail. This system has been the engine of genuine economic progress in our society. Under this system, the United States has become the wealthiest and most powerful nation on Earth.

Now, when some foreign producers enter our free market and offer more desirable products than some domestic producers, how does it suddenly become the patriotic duty of consumers to abandon their role of free-market buyer and "go out of their way" to buy American? Buying a less desirable product in order to "help keep our neighbors employed and off welfare" is not "economic common sense" at all. It's charity. It's short-term humanitarian aid, a form of middle-class welfare that subverts our cherished free-market economy and hurts our national strength in the long run.

BUYING A LESS DESIRABLE PRODUCT IN ORDER TO "HELP KEEP OUR NEIGHBORS EMPLOYED AND OFF WELFARE" IS NOT "ECONOMIC COMMON SENSE" AT ALL. IT'S CHARITY.

So who's not being patriotic and supporting their fellow countrymen when American musicians buy Japanese instruments in ever-increasing numbers? I'll tell you who. It's us instrument builders whose instruments you're not buying, that's who! Somewhere along the line, each of us has neglected to build desirable instruments at the right price, or we've neglected to manage our businesses so they are profitable and financially sound. Many of us have faltered or failed, and in doing so we've taken a toll on our national economic vitality.

When I began studying electrical engineering at Columbia University, our Dean of Students gave us a definition of an engineer: "An engineer is someone who can do for two cents what any damn fool can do for three cents." This should be the golden rule of engineering. But we seemed to lose sight of this wisdom as we worked through courses in circuit theory, solid state electronics, and advanced mathematics. We were taken with how clever we were becoming, and sneered at those of our fellow students who were majoring in

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Bob Moog is the principal developer of the Moog synthesizer.

mere industrial engineering. Those were the guys who would be running the factories while we would be sitting in our air-conditioned offices, designing one clever circuit after another. By the time we graduated from Columbia, we'd forgotten about our Dean's advice to be better than a damn fool when it came to making things at the best price.

Thus, when I started Moog Music (called R. A. Moog, Inc. back then), I had little understanding of how to manage manufacturing. But what's worse, I had no understanding at all of how to manage a business. I hired several electrical engineers like me, and together we managed to build a lot of synthesizers in the 1960s. But we wasted a lot of effort and money, and when our market became saturated and the first serious competition came, we simply ran out of money. The company eventually became of division of Norlin Music and, after being mishandled by a string of managers with more testosterone than management smarts, dropped out of the musical instrument manufacturing business about eight years ago.

At its peak, Moog Music had about 300 employees. How many overpriced, underfeatured instruments would have to have been sold to well-meaning musicians who wanted to "keep our neighbors employed and off welfare," even for one year? Well, at an average salary of, say, $15,000 a year (back then), and manufacturing labor being about 20% of an instrument's retail price, you musicians would have had to cough up about $22 million just to keep Moog Music's employees off welfare for one year! For sure, everybody was better off with the forces of competition pushing my old company swiftly and mercifully into the ground.

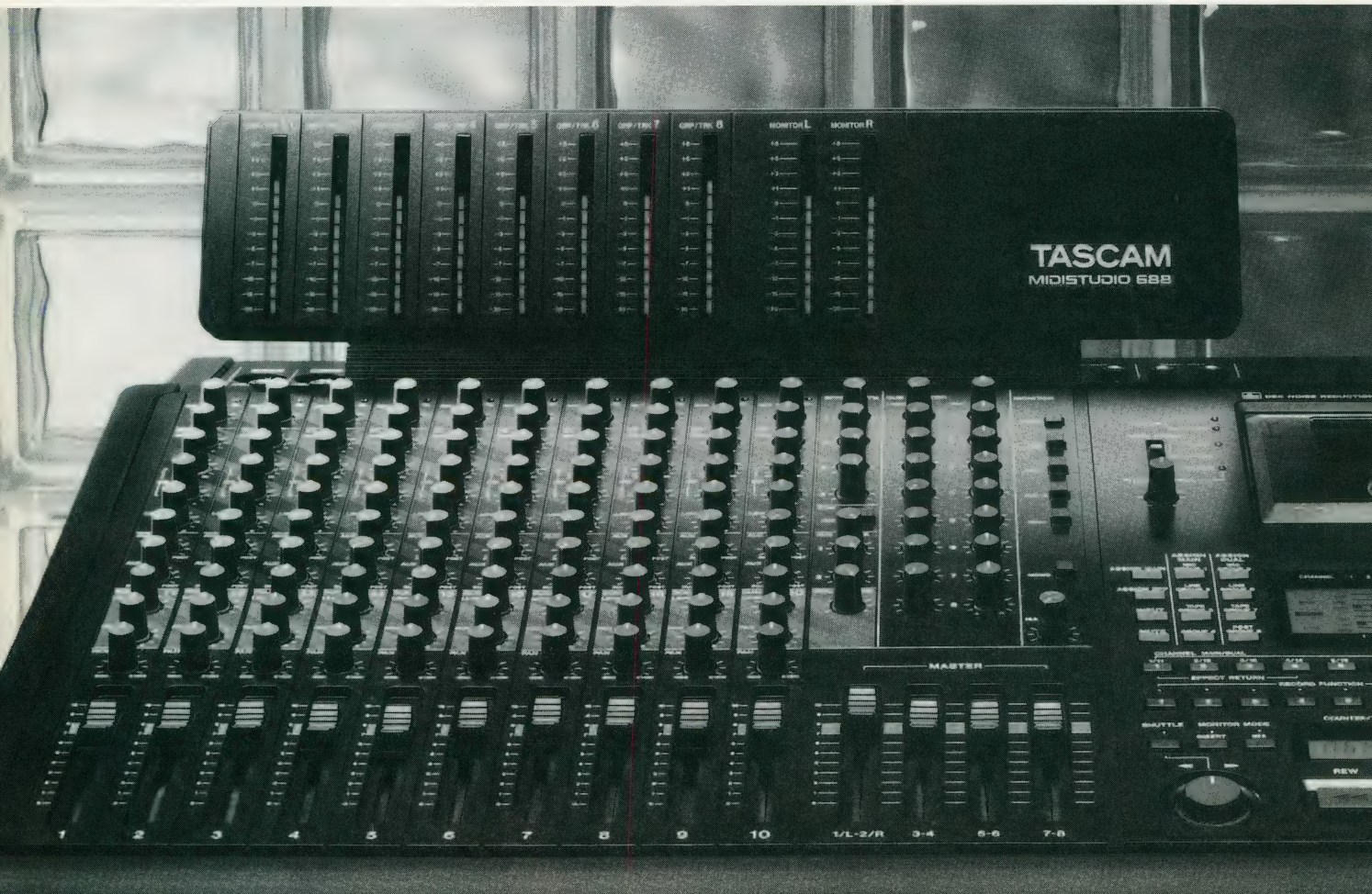
An unusual story? Not at all. Moog's chief competitor, ARP Instruments, was riding high during the early '70s. But by the late '70s, a combination of mismanagement, bad product development decisions, and really nasty infighting in the front office propelled the company into involuntary backrupcy (the worst kind). Lots of people were laid off. Should musicians have done their patriotic duty and come to ARP's rescue by buying carloads of poorly conceived, overpriced products? Are you kidding?

Another example is an Italian electronic keyboard manufacturer that I did some work for about ten years ago. It was a well-established company, originally an accordion manufacturer. But as electronic instruments increased in complexity, the sophistication of their management still remained geared to the labor-intensive practices of their earlier days. Shortly before its demise, the company was shipping instruments that had a mean time between failures of three weeks! Still, the head of the company would go on his daily rounds to turn out lights to save electricity, and to belittle the men and harass the women to remind everybody who was boss. So how many Italians do you think stepped forward to buy the company's instruments "to keep their neighbors off welfare"? None that I know of.

Space limitations prevent me from regaling you with more stories of instrument manufacturers who are no longer in business. Like Moog Music, most of these companies did enjoy a few years of successful, profitable operation, but then failed because of a combination of inadequate marketing, manufacturing control, and financing. Most had been founded by engineers who were not trained managers. And more to the point of this editorial, no amount of "going out of one's way to buy American" would have saved any of these companies.

To be sure, there are many American instrument companies that have operated successfully for many years, who have grown, and who have consistently offered successful, desirable products. My hat is off in admiration to Peavey, E-mu, and Ensoniq, to name three companies who are doing the right kind of job for their employees, their customers, and their country.

Let me put down a few words about global competitiveness. Much of what we buy and use in our daily lives comes from outside our borders, because the production capacity to meet our needs does not exist here. Let's not get into why it doesn't exist, but merely note that if our supply of foreign petroleum, TV sets, sport shirts, computer printers, paper clips, rum, cheap shoes, expensive brandy, and thousands upon thousands of other items were to be cut off tomorrow, our domestic producers of these items



could not keep up with our needs, and the conduct of our daily lives would be severely curtailed. To pay for all these foreign-made items, we have to export stuff that people in foreign countries want to buy. The more we export, the more foreign currency we have and the easier it is for us as a nation to afford the foreign goods that we need. This means that companies that make products that foreigners are willing to buy are helping us all to have foreign goods that we need.

Now, how do you help a company to be competitive in the world market? By saying that you'll buy its products just because they're made in America? No way! Any time a company perceives that it has a captive, unquestioning market, it becomes less competitive. I've seen it happen many times, especially in the early days of synthesizers. To take an extreme case, look what happened in the former Soviet Union and the Eastern bloc countries. They went one step beyond asking their citizens to give preference to their domestic goods. Through their import restrictions, they made it virtually impossible for their citizens to buy foreign goods. The result: Has anybody ever seen a Soviet consumer product that's competitive in the world market (except maybe for vodka and caviar)? What Soviet car would you buy? How about a nice Soviet jacket or portable stereo? None of these things exist as world-marketable products, because the manufacturers of these products, having a captive domestic market, grew inefficient and unresponsive.

Here's my answer to how to help your fellow American instrument builders: The next time you need an instrument, buy the best one for your needs that you can afford. If it happens to be an American product, great! Write to the marketing department of the instrument manufacturer, and tell them why you like their instrument. If they're on the ball (and they probably are if they got as far as making instruments that you like), they'll use your letter to fine-tune their product development program.

On the other hand, if you wind up buying a foreign-made instrument, it's your patriotic duty to write to the American manufacturers whose products you didn't buy, tell them whose product you bought, and tell them why. If a company reads your letter and acts on it, then you have helped them to improve their product line, thereby helping them to be more competitive worldwide. The day's pay or so that you denied some worker in that company because you bought a competitive product should be more than offset by the increased business that the company will enjoy because of the information you gave it. Or, if some company receives your letter and ignores it, then it won't last long anyhow, and the sooner its employees find employment elsewhere, the better it will be for them.

I'll close with a response to Marshall's crack about "the folks that gave us Pearl Harbor." Yes, Japan gave us Pearl Harbor, no doubt about it. They were able to do it because their country was under the control of an imperialist, warmongering regime. As it turns out, the Japanese people paid dearly for their military adventures. Today, the political climate in Japan is decidedly pacifist. The Japanese people have directed their energies and their intelligence to economic, rather than military, achievements.

In our free market economy, playing our free market game, the Japanese have made dramatic progress. In many cases, especially consumer electronics, they've gone far beyond us. They started out with the same technology that we had, but while we were keeping hundreds of thousands of people busy designing Star Wars Space Zappers and stockpiling nuclear weapons like so many bales of hay, Japanese engineers developed the technologies for portable DATs, professional-quality hand-held video cameras, and, yes, digital keyboards. The Japanese nation has become wealthy by designing and making these things, and their products have given millions of people around the world great pleasure and enjoyment.

As a nation, we no longer need Space Zappers and thousands of nuclear weapons. We no longer need a military-industrial complex of the size that has developed over the past 40 years. Now, for our own safety as well as our own economic well-being, we have to put a stop to being the world's arms purveyor and start designing and building products that people at peace want to buy.

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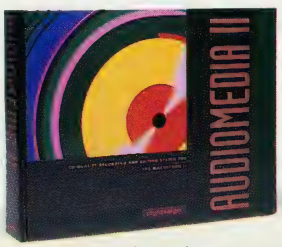

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CREATIVE OPTIONS

CONNOR FREFF COCHRAN

ATTACK OF THE DREADED BLUE LIGHT BULB

I BLAME DUNCAN EAGLESON, actually.

Yes, I bought the damn thing. I admit it. But it wasn't me who first used it to *commit* conceptual vandalism. That was Duncan. My own crimes were just a response to his scurrilous pattern of attack and ceaseless escalation. Truce? The man didn't know the word. Retaliation? Tit for tat, bucko, that was my motto, and an eye for an *ai-yai-yai* (or an *oy vey*). Crazy? Me nine-eighths Irish, him a blackhearted Scot, and you really have to ask? Of course it was crazy!

It was also a tremendous amount of fun.

Let me set the scene. This was seven or eight moves ago, back when I was living in a mansion at 81st Street and 23rd Avenue in Bensonhurst, Brooklyn. It really was a mansion, all red brick and green tile and just plain gorgeous, with a second-floor bathroom like something out of the glory days of the New York transit system. Back in the '30s the building had been the private home of the man who owned the Loew's theater chain; in the '50s it spent a brief bitter spell as an old folks' home; and then in the early '70s it was finally sold and converted into apartments. The new owner was an aging contractor who had stood before it as a penniless immigrant child and sworn that someday he would be wealthy enough to buy it. (Yes, Virginia, in America anyone can grow up to become an absentee landlord.) Amy-my-then-wife and I rented the second floor from him early in 1979; the arched tile ceiling and stained glass in the bathroom clinched the deal. Amy called the building The Frog Palace, in honor of the two stone frogs that the owner had permanently vandal-proofed by cementing them to the stanchions of the gracefully curving front steps. In some former lifetime they had been part of a fountain, and as you walked up the steps the little copper tubes in their mouths were aimed straight at you. New visitors always found that a little daunting.

Over the next few years what started as a simple nest for the two of us, one roommate, and 17 skazillion books — Amy was a librarian not only by trade but by ardent nature — started to change. Roommates came and went, and multiplied. Amy discovered a talent for the craft of soft sculpture and attracted cohorts. My own art and writing projects drew collaborators. People came to visit. And then to stay over. And then, in some cases, to stay. At its height, our floating hotel and artists' colony sheltered six rent-paying regulars, four freeloading cats, some fish, one turtle, a widely varying crew of short-term guests who would stay anywhere from one night to three months, even more books than we moved in with, three art studios, four writing desks, and one thoroughly soundproofed recording studio.

The recording studio was mine. It was a false, floating room built within a small bedroom, a 13x13-foot space-and-time capsule surrounded by two tons of sheetrock, plywood, fiberglass, and rubber, and then filled to bursting with every musical gadget I could find. The extreme design was intended to keep outside sounds off my tapes, Bensonhurst not being noted for its sonic resemblance to the Elysian Fields. This had two side effects: (1) I could work as loud as I might want, day or night, and never disturb anyone; and (2) Whenever the gear was turned off the place was dark as a tomb.

Enter the blue light bulb.

The theory was simple. The studio itself was basic and functional, a sheetrock box devoid of aesthetic content; angular frequency absorbers on the false ceiling and the Sonex behind the monitors were the only breaks in its monotony. The gear gave the place what feeling it had, and that was the feel of gear, no more, no less, all boxes and cables and tape machines and keyboards and blinkie starship lights. It was *cramped* in there. I needed a way to create different working moods, partially to nurture inspiration and partially to keep from zoning out. Since the only controllable variable was the lighting, that's what I chose to experiment with.

People whose lightbulb-shopping experience begins and ends at the nearest Safeway have no idea what a spectrum Mr. Edison's invention is available in. Me, I had Just Bulbs at 22nd and Broadway in Manhattan to draw on, plus all the colored gels offered by wholesale theatrical suppliers. The range was dazzling.

Soon enough I was mixing musical tone colors and spectral lamp colors with mad abandon. Red light brought up predictable primal emotions. The amber range worked especially well with me, though for some reason pure yellow did not. And greens and purples were good for different kinds of quiet intensity.

But the blue light bulb was a dead loss. It just was. Pale blue, like old anti-freeze, and kind of sickly, as if the photons came out of it cringing. I tried it once, rejected it immediately, and put it back on the storage shelf.

Weeks later I walked into my dark studio, all unsuspecting, reached for the switch on the light above the mixing board, and threw it.

Blue. Blue blue blue blue blue. Pale, sickly blue.

Thus it began. One of our artist roomies, Duncan Eagleson, driven by demons unknown, had swapped the bulb as a practical joke. And the effect was just what he had hoped for, because the gap between expectation (brave white light) and delivery (wimpy blue) was, indeed, a jolt. If I ever needed evidence of how thoroughly and completely for granted I took the

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The place changes, but the mailing address remains the same. You can send your creative decorating tips directly to Connor Freff Cochran at 524 San Anselmo Ave. #229, San Anselmo, CA 94960.

ILLUSTRATION: SARA KINNEBERG

little things in my environment, this was it.

Naturally I retaliated in kind. That night, when he started work on a new painting for his portfolio, *zing* — blueness!

The next day the blue light bulb was in the lamp over my writing desk.

The next day. . . .

Well, you get the picture. And it got worse when the rest of the household joined the game. Soon no light switch was safe. The dreaded blue light bulb could appear anywhere, at any time. We got to where we started checking the bulbs *before* we turned them on (and what a thrill it was to confound a jokester by detecting the blue bulb before it could surprise you). Then a day, or a week, or two weeks would go by in which nothing happened, and our guard would lapse. Suddenly: *Zing* — blueness! all over again.

Eventually the joke ran its course. The dreaded blue light bulb burned a final time, and its victim chose to smile and put the bulb to rest instead of passing on the misdeed. But I confess to you: Even today, a continent away and eight years later, I still half-expect to encounter the damn thing with every light switch I throw.

Truth is, I kind of miss it.

These thoughts rise in me now because I am moving (again) and for the first time in a long while will have a chance to create a working and living environment of my own instead of having to fit, preferably with minimal impact, into one that is already there. These days I own little beyond my tools, and only the most necessary of those. I am faced, abruptly, with new choices.

Dishes? What kind of dishes? What material, what color, what shape, what weight, what design? And what about glasses? Or curtains? Cutlery? Bath towels? Bedding? Lamps?

. . . Lights?

Consider your own living environment. How much of it reflects your choice, and how much is just an accumulation of random material goods, like barnacles on the hull of a ship? The places in which we live can either echo our insides or bind and confound them — which is it for you?

There are many ways to fill a place with spirit, to keep an environment fresh, to make it yours. One man I know covers every inch of the walls of his studio with his own work, and constantly changes the mosaic. A woman artist of my acquaintance takes a different tack, keeping one white-painted room utterly empty except for the bare minimum of tools and reference she needs for each of her sculptures. If the piece is small she will even seek out the perfect part of the room to sculpt in, working close in a chosen corner for one creation, near the door for another, and dead center for yet another. I've also known her to draw concept sketches on the walls during a project, and then paint over them before she begins anew. What these two artists have in common is the intensity of attention they bring to their respective spaces. They do not simply work there. They invest themselves.

In making a place powerful you can draw on sound, or light, or color, on props or shape or change, even "disorganization" in the form of atypical or unexpected order based on different classifications than the norm. The latter approach can work on any scale, and pull positive effect from even the mundane. For years I have organized my music collection alphabetically, not stylistically, so that cultures and categories intermix in unpredictable and intriguing ways. And in my new place the "bedrooms" are going to be offices and studios, while the "living room" will be the bedroom — a far more profound emotional switch than it may appear on the surface. A good creative space is by nature a compromise between function and aesthetics, but it must also be a compromise between familiarity and surprise: Familiarity because you have to be able to safely rely on it in the heat of creation, surprise because to become so familiar with a place that you no longer *see* it is to lose touch with a wellspring, to become that little bit closer to dead known as "deadened."

Zen priests rake gardens of perfectly positioned stones. Crazed performance artists build private caves of perfectly arranged junk. It's all one, really, a symbiotic, purposeful bonding of place and person. One can't work without the other.

If you'll excuse me now, the move looms and I have shopping to do. So much to buy! Microwave, sheets, shelving, futon, laundry hamper . . . light bulbs. Sure hope I can find the right shade of blue.

Light as a feather

at only twelve pounds and with 350 watts RMS continuous per channel, the new Peavey DPC™ 750 is truly a power amplifier heavyweight!

This next generation of digital power amplifiers utilizes a patented digital phase-modulated MOSFET design which represents a totally new concept than any previous amplifier technology, linear or digital. So, step into the ring with the new lightweight heavyweight champion ... the DPC 750 ... It'll knock you out! And as you catch your breath, notice the price of this *single rack space* wonder! Bolt to your nearest Peavey dealer and hear the power!

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ART

THE SOUND OF PERFECTION

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OTHER WINDOWS

JIM AIKIN

HAMMER & TONGS

BEING AN ARTIST IS EASY, RIGHT? Creativity happens by magic. You just wave your magic wand at the piano, sequencer, or piece of score paper, and presto, your *genius* takes over. A flawless work of timeless beauty flows forth.

In your dreams, maybe. And we all need dreams. But artists who are just starting out have nothing but fantasies to guide them. They don't know what being a full-time artist is like, because they don't have any experiences of their own, and nobody has bothered to tell them.

That first white-hot burst of enthusiasm for music is vital. If you don't have it, and nurture it, you'll never get far. But at a certain point, trying to preserve your enthusiasm in a glass jar by clinging to simplistic fantasies about creativity can get you in big trouble.

Recording an original song into a sequencer, to take a concrete example, is typically a messy, complicated, uncertain business, filled with false starts, distractions, and cowbell tracks that, after you spend five hours getting the rhythm pattern, quantization groove, and track offset nailed, turn out to sound just awesomely stupid no matter which reverb algorithm you run them through. That's what it's like for me, anyhow. The more I learn about composing, the more musical issues I have to confront.

Consider a person who has just acquired a MIDI sequencer. He or she (let's say it's a she) sits down to compose the next phrase in her new piece. She thinks of a way to get from point A to point B — from the end of the chorus to the beginning of the bridge, say — without violating the norms of the style in which she is working. She records the phrase, plays it back a couple of times, adds a drum fill, and then sits back and congratulates herself on her cleverness. She goes on to the next section of the piece, satisfied that she's done her job as a composer.

Nothing wrong with that. It's what we all do when we're learning the craft of composition. But it's not the end of the journey. It's the beginning.

A competent professional composer can show you ten ways to get from point A to point B. Maybe twenty ways. A professional can make up more ways to do it on the spot if need be. Some of them will be silly, some will be dull, some will be perfectly okay but out of character compared to the rest of the piece. Maybe three or four will be usable.

Maybe one will be inspired. Maybe.

"Hey, mister. I just painted a painting. How can I get it hung in the museum?" When you put it that way, it's a silly question. The museum director doesn't want to talk to a person who has painted just one painting. And let's be clear about this: It's not because the museum director is a snob, though she may indeed be a snob; it's because the painting isn't good enough. It may have points of exceptional interest. It may show great promise. The aspiring painter may have had a deeply moving spiritual experience in the process of painting it. But that doesn't make it worthy of being hung in a museum.

Yet when it comes to songwriting, or recording a demo tape, musicians have been known to expect that their first halting efforts will put them over the top, career-wise, and to get terribly discouraged when the world doesn't agree. Their own emotions while creating the piece are so vivid that it never occurs to them that the finished work doesn't actually convey those emotions to the listener in an effective way. To get the feelings across, a lot more sawing and hammering and puttying and sanding will be required.

Into every commercially successful recording goes a great deal of invisible craft. If you don't hear the craft, it's because the composer and arranger and performers don't want you to. The sweat and labor is supposed to vanish, leaving only the pure musical intention with no distractions.

What about improvisation? Doesn't that flawless spontaneous flow contradict the idea that you need to sweat over your music? Not really. A good improviser has spent thousands of hours in the woodshed, discovering and developing a dazzling array of ways to get from point A to point B, so that she can haul one or another of them out at the drop of the hat.

Being an artist means work, work, and more work. Now, this doesn't mean that an accomplished composer or arranger doesn't sometimes (or often) create a phrase, seemingly out of empty space, that's perfect right out of the gate, just exactly as it is. That happens. But years of work went into the "effortless" creation of that phrase. Also, it was the years of work that allowed the composer to recognize the perfection. Knowing when not to meddle with your first rush of inspiration is another skill that requires plenty of painful practice.

When I first started writing science fiction, I wrote half a dozen stories and sent them off to magazines. One of the six, as it happens, was eventually bought and published. The other five, looking back on it, were complete dreck.

When consulting editor Jim Aikin was a freshman in high school, his father made him take woodshop. Both the spice rack and the footstool that he made are still in use.

ILLUSTRATION: COURTNEY GRANNER

At the time, I may have sensed dimly that perhaps they weren't quite the stuff of which literary legends are made. But I enjoyed the process of creating them. I learned a lot, too, along the way, but I wasn't sitting there grinding them out, gritting my teeth and saying, "I've got to *learn* this stuff." I was having a good time, pure and simple. If I had known how bad those stories were, I would probably have given up in frustration. Sometimes ignorance *is* bliss.

If you enjoy creating music, you'll probably enjoy it even more as time goes on, as you learn more intricate and subtle ways to bang a piece into shape. Don't let yourself get discouraged by the seemingly endless labor of creating. It can be hard to keep up your enthusiasm when the world isn't giving you the kind of positive feedback you need. Your ignorance of your flaws, in the early days, may be a blessing, if it keeps your spirits up. If possible, arrange to discover your weaknesses one at a time.

When you look back at work that you did a few months ago and suddenly see nothing but a seething mass of corruption and decay, it can spur you to new heights, or it can drag you down so heavily that you're tempted to give up. Ah, but when you see that something in your music isn't working, that's actually *good*. Now you know what direction you need to go next — what techniques you need to learn or develop.

The process doesn't end. There's always more to learn, and there will always be flaws in your finished work. You may be acutely aware of them. (God, how could I have ever mixed the kick drum so loud?) But your listeners will probably be less critical than you are.

Sometimes you get stuck. You cudgel your brains, and you can't for the life of you figure out what to do with a piece of material. Sometimes what's happening is that you're blocking because you've gotten too attached to something that you've already composed. There's an element that you *think* is essential to the piece, but it doesn't quite fit with something else that's also essential, and your unconscious (the factory where all the ideas get put together) has walked out on strike. The unconscious knows perfectly well that the two bits *don't* work together. In a case like this you may have to backtrack, throw something away that you think is too beautiful to live without. (Store it in a separate disk file and save it for the next piece.) You may have to ask yourself some tough questions about what you're trying to achieve with the piece as a whole.

Another thing that can cause a block is that your critical judgment has gone ballistic, and is rejecting, one by one, the possible solutions

to the problem that your unconscious proposes. Again, in such a case the unconscious may just throw up its hands in discouragement and go out for pizza and beer.

Here's a simple unblocking technique that I use. I use it in plotting fiction, but it should work in almost any creative endeavor more deliberate than Japanese brush painting. Let's say I'm trying to draft a scene where my swashbuckling hero and his sidekick need to steal a wooden chest containing 5,000 gold pieces from a locked and heavily guarded vault, and I can't think of how they could possibly manage it. I sit down in front of a blank piece of paper, and at the top of the paper I write, "Ten ways to steal 5,000 gold pieces from the vault." *I then start listing all the ways I can think of, including the silly, stupid, useless ones.* No self-censorship is allowed. The ideas don't have to be sensible, they just have to get the story from point A to point B.

What usually happens is that somewhere around idea six or seven, I come up with something that I like. Maybe two or three things that I can combine into one complicated piece of action. All of a sudden I'm not blocked any more. I'm having fun again.

Doing the brainstorming session at the end of the evening, when I'm already in my jammies, is sometimes helpful. I may not be able to see the way out of the woods even after I make the list, but my unconscious can ruminate on the possibilities all night long. The next morning, a new solution, better than any of yesterday's rough approximations, may pop into my head as if by magic.

Try it with your next piece of music. You're at the end of the verse and you can't figure out a smooth transition to lead into the chorus, or you've got a transition that sort of works but that seems a little flabby. Sit down with a piece of paper and make a list of ten ways to do it, or twenty. Two bars of solo 64th-notes on a rented bassoon. (Remember, no self-censorship allowed.) A break with duelling kick drums. A sampled choir singing syncopated pitch swoops. Okay, now it's your turn. . . .

When you've got a list, pick out four or five items that feel exciting. Reserve some empty tracks in the sequencer. (Multi-channel tracks are helpful for this, as you may want to record two or three instruments into each track in order to be able to mute and unmute them quickly as a group.) In each track, record a completely different transitional phrase. Different harmonies, different rhythms, different instrumentation.

Somewhere along the line, one of your ideas will probably grab you. Or bits of two or three ideas will, and you'll find yourself madly banging on them to get them to fit together.

Professional carpenters take good care of their tools. As an artist, you have maybe a rack of tone modules, maybe a treasured guitar. But the real tools are the ones between your ears. Acquire a good large set, keep them polished, and learn to use them deftly. As time goes on, you'll start to know almost by instinct when to reach for a power sander, and when a wad of chewing gum will do the trick. ■

GREG RULE

I purchased a Kurzweil 250 while visiting the United States. Since I live in Spain, I have to be very careful with the power connections, as the current here is 220 volts. During a recent recording session, the engineer plugged in the power supply unit without taking this into consideration and, consequently, damaged the unit. I've asked the distributors of Kurzweil in Spain for help, but unfortunately they don't have any information about this model. Is it possible for me to obtain service manuals so I can try to repair the unit myself?

Pablo Salinas
Madrid, Spain

Unfortunately, we know of no authorized K250 repair centers currently set up in Spain. According to Kurzweil, Sweetwater Sound of Fort Wayne, Indiana is the one and only authorized source for K250 service and support. Their typical method of repair is a complete board swap, meaning the customer sends Sweetwater the damaged component, they test it, and, upon evaluation, send the customer a replacement. The 250 contains three major boards: the CPU, the CGP (central group processor), and the Channel (audio) board. Each board costs $250 to replace. In your case, the power supply (housed inside the K250's Pod footpedal assembly) is probably the first item that needs to be checked for damage. Individual components from the assembly can be ordered, or the entire Pod unit can be replaced for $750. Be sure to contact Sweetwater before shipping any damaged parts to them for replacement. Bruce Hendrix is the in-house K250 specialist. He can be reached at: Sweetwater Sound, 5335 Bass Road, Fort Wayne, IN 46808. (219) 432-8176, fax (219) 432-1758.

I'm planning to release my own promo cassette of electronic instrumentals, and I want to include three or four arrangements of songs by other artists. Do I have to contact them directly and work out a contract? Seems like a nightmare! How do I go about it? And do I have to pay royalties even for copies of the cassette that I distribute for free, or only for those I actually sell?

Adam J. Kinsey
Omaha, NE

We forwarded your question to Dean L. Surkin, an occasional *Keyboard* contributor who is an entertainment lawyer with a practice in Manhattan. He explained that in the case of almost all songs that have previously been released on a record, payments of mechanical royalties in the U.S. are handled through the Harry Fox Agency (205 E. 42nd St., New York, NY 10017. Phone [212] 370-5330, fax [212] 953-2384). Call or write to them and ask for a copy of their mechanical licensing instructions, and the forms to fill out. The instructions are simple, and the form is only one page per song. The rate of payment is fixed by law at $.0625 for each copy of a song of up to five minutes playing time, plus $.012 per additional minute or fraction thereof. That's per copy, so if you make a thousand cassettes containing one three-minute cover tune, Harry Fox will send you a license and a bill for $62.50. You must pay the mechanical royalty for every copy you distribute, whether or not it is sold. "Even if no money changes hands," Surkin tells us, "you are deemed to gain a benefit — publicity, for example — from the usage of the song."

In addition, you would be well advised to print the proper copyright notice for each song in your liner notes. To find out what notice to print, you need to know who the copyright owners (usually the song publishers) are. The song indexing departments of ASCAP ([212] 621-6160) and BMI ([212] 586-2000) will provide this information. You then contact each publisher separately to get the correct copyright info.

If the song has never been released on a record, you must use a different procedure. In this case, you'll have to contact the copyright owner directly and negotiate a mechanical royalty for your project. Likewise, if your arrangement adds new lyrics, the compulsory license procedure is no longer appropriate. Again, you'll need to contact the copyright owner for special permission.

I have a question regarding MIDI volume (controller 7). First, is there any way to get a smooth fadeout? There's always a jump between values 1 and 0. And second, I get a "spiky" response to MIDI volume from some of my modules. Is there any way to get around this annoying click-click-click?

Morgan Fisher
Tokyo, Japan

As you've discovered, so-called MIDI "continuous" controllers aren't actually continuous. They're made up of small discrete steps, with a maximum of 127 and a minimum of 0. In most situations, the steps are close enough together that you won't hear a move from one to the next. When you can hear the discrete jumps in volume, it's called stairstepping. (See Figure 1.)

If your instrument doesn't have some sort of built-in smoothing routine to cushion the step between volume levels of 1 and 0, the only real cure is to feed the instrument's output through an external MIDI-controlled VCA unit that will do the smoothing. (Two such units, the JL Cooper MixMaster and the CM Automation MX-816, are reviewed on page 138 of this issue.) You might also let the synth manufacturer know that you don't appreciate this phenomenon; if they hear from enough people, they're more likely to solve the problem in future instruments.

The other part of your question relates to what is called "zipper noise." Some older instruments introduce a small high-pitched click into the output signal when changing volume levels. This is more objectionable than simple stairstepping. Not much can be done to eliminate zipper noise. To reduce its impact on your music, try moving the volume controller more slowly. When a controller such as a wheel is moved quickly, often only a few values are sent — volumes of 127, 98, 56, 29, and 11, for example. We've found that in the real world, the more values you send, the less audible the zippering will be, because the steps are closer together. (If each step produces a click, then you want to send as few values as possible.) If you're sequencing, you may be able to program the volume change for the noisy module into the middle of a cymbal crash, which will mask the zippering, or program it at a point in the music where that module isn't making a sound.

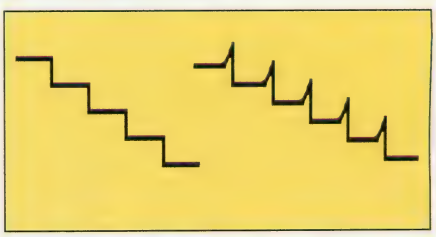

Fig. 1. MIDI volume changes are subject to stairstepping (left), in which the volume drops in fixed, discrete steps, much like descending a staircase. On certain older synths, zipper noise (right) may also be a problem; as the volume changes, audible spikes may be generated at each of the stairsteps.

The Top 500

Play the D4 with its onboard trigger inputs.

Alesis drum machines are famous for their sounds. The HR-16's natural acoustic drums are still the standard for transparent rhythm tracks. The punchy aggressive samples of the HR16:B redefine how to make rhythm tracks burn. The SR-16 is an instant hit with its sampled reverb and ambience techniques.

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1	2	208	**HONEST SNARE** HR-16	ALL WOOD-BRASS RIM
2	NEW ▶		**STUDIO TOM** BRAND NEW D4	16" MAPLE TOM w/VERB
3	NEW ▶		**BIG "O"** BRAND NEW D4	DOUBLE HEAD KICK w/VERB
4	5	52	**RIM SHOT ROOM** SR-16	BRASS PICCOLO w/VERB
5	10	156	**BIG FOOT** HR-16:B	SINGLE HEAD 26" MAPLE
6	NEW ▶		**SLAM** BRAND NEW D4	POWER TOM w/VERB
7	23	156	**COMBO SNARE** HR-16:B	PICCOLO PLUS WOOD
8	NEW ▶		**BIG BALLAD** BRAND NEW D4	WOOD SNARE w/BIG VERB
			FAT CITY	SUPER FAT SNARE

THIS WEEK	LAST WEEK	WKS. ON CHART	TITLE / ARTIST	
302	NEW ▶		**RAW HIDE** BRAND NEW D4	CUSTOM
303	450	52	**HI ROOM TOM** SR-16	10" MAP
304	NEW ▶		**WET HALF** BRAND NEW D4	HALF OPEN
305	327	52	**RIM 2 CENTER** SR-16	ART
306	123	208	**DOUBLE HEAD**	DOUBLE HEAD
307	223	15(		
308	401	5'		
309	NEW ▶			
310	175	1		
311	NEW			

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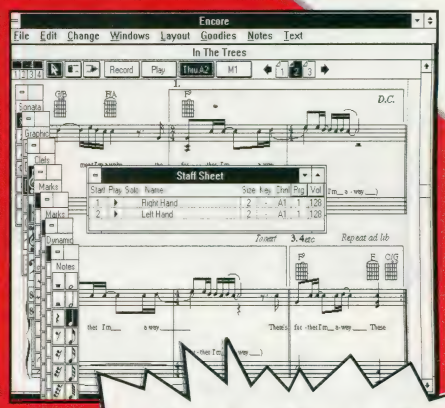
- ***Extract Multiple Parts*** - Create parts for any number of instruments.



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PC MAGAZINE EDITORS' CHOICE

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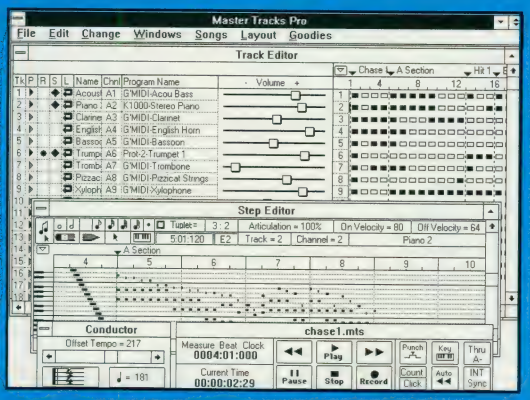

- **Graphically Edit MIDI Controller Data** - Modify controllers by drawing a line with the mouse.
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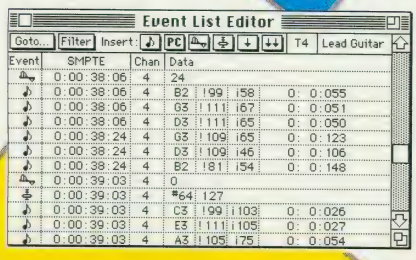

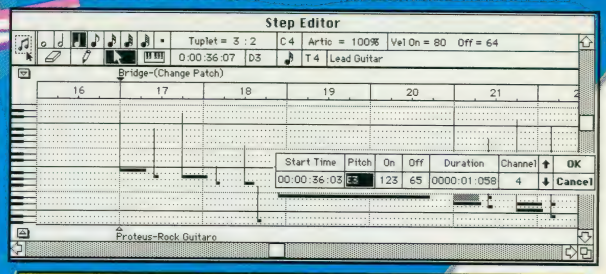

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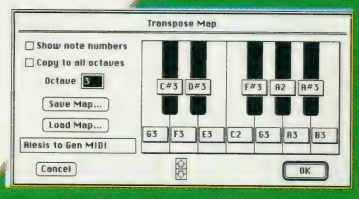

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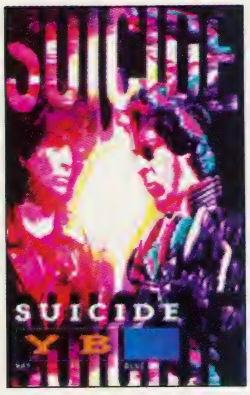
ROBERT L. DOERSCHUK

RECORDINGS



Suicide, *Why Be Blue* (Brake Out, c/o Enemy Productions, 11-36 31st Ave., Long Island City, NY 11106).

Ah, those textures! Those snares that snap like cellophane. Pin-prick sequences that sting like steel darts. Spooky synth pads. It's Suicide — synthesist Martin Rev and singer Alan Vega, the doomy duo that helped launch the proto-techno movement back when punk was young. Bands like Depeche Mode took their cue from these guys, as do today's techno stylists. Keep that in mind when playing *Why Be Blue*; though this reunion album sounds like a ripoff of modern dance music, the fact is that Suicide was churning this stuff out when raving was something that only politicians and parents did. True to the spirit of mid-'70s synth-rock, Rev keeps his colors cool; with minimal textural contrast, the mood stays cloudy, aside from scattered digital sprinkles now and then. In this age of bomb-blast backbeats and unrestrained coloration, it's good to be reminded how much rhythm the early synth bands got from much lighter, more "primitive" snares, and how much expression can still be wrung from a limited range of timbres.

The Dixie Dregs, *Bring 'em Back Alive* (Capricorn, dist. by Warner Bros.).

For fans of pure, no-apologies-needed, flat-out, real-time, burnin' live music, the current Dregs reunion tour is the best news of the season. And if you can't make one of their concerts, this live set, recorded in Atlanta last Valentine's Day, is more than you'll need to smile awhile. Guitarist Steve Morse is still the band's central figure and most frequent soloist, but in charging through intricate rhythm arrangements and tearing up the open solo stretches, everyone is plain amazing. T Lavitz, in particular, never sounded better. As accompanist and section player, he covers all the bases faultlessly in tunes of extraordinary complexity. His micro-fills, biting clav-type rhythms, and outside harmonies in "Odyssey," not to mention his classic pitch-bend synth lead on "Kashmir," will wake up even jaded Dregs fans who have come to expect excellence as a matter of course. But the unbelievable traded fours with Morse on the "Assembly Line" may be the hottest improvised tracks ever recorded by T. We've said this before about the Dregs and been proven wrong, but after experiencing *Bring 'em Back*, here goes again: It *can't* get any better than this.

William Aura, *Every Act of Love* (Higher Octave).

Is it dreamy, hypnotic? Yep. Is it new age? Yawn, next question. What about the wimp factor? Does Aura's latest offering hang in the air like wet laundry on a windless day? Not at all; gentle rhythms, enlived by occasional bass pops or percussive thumps, nudge each tune along at steady medium tempos. But the effect is similar to that of more formless, trance-inducing new age pieces; squalling guitar leads, jazzy flute lines, moderately active drum tracks, and even a pseudo-rock piano solo on "Let Yourself Go" are mere whispers in the stillness. For all the toe-tapping beats and clear-cut chord changes that would seem to demand some critical attention, *Every Act of Love* passes our massage test, *i.e.*, this album works best when the listener is semi-conscious and being stroked by peacock feathers. Congrats to Aura and the five other credited keyboardists for their success at using coherent musical forms to create the impression of dazed formlessness. And pass the patchouli.

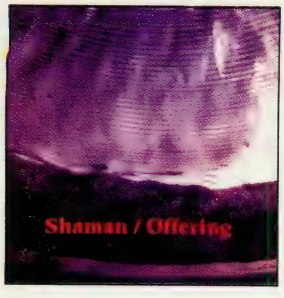
Kenny Werner, *Press Enter* (Sunnyside, 138 W. 19th St., New York, NY 10011).

Where most jazz pianists draw energy from the tunes they play by building momentum through consecutive 16-bar choruses, Werner prefers thwarting listener anticipations of recapitulations. His compositions are minefields through which he and his trio jerk, slide, and buttonhook with discipline and abandon. Prime examples on this album include "Hey Reggie," which sustains both wit and depth through a mishmash of references to mainstream jazz styles. Even more kaleidoscopic is "A Little Vibe," which hop-scotches through languid reflective episodes, snatches of singsongey waltz, melodramatic silent-movie tremolos, and an Afro-balladic treatment of "The Lion Sleeps Tonight." Werner's impish instincts manifest in written and extemporized quotes — from "As Time Goes By" and "Pick Yourself Up" on "In Tune," from the "Hallelujah Chorus" in "Hey Reggie." Yet none of his shenanigans block the broad flow of his ideas; where other pianists would be overwhelmed, or even uninterested in exploring, these sorts of settings, Werner accepts the challenge and triumphs most impressively.

ISH, *Round and Round* (ISH Records, Box 255, Miltown, NJ 08850).

Can this guy — he calls himself Man in the album credits — put together a dance groove? Absolutely, although we wish he had stretched himself a bit more than he does on this collection. True, there are nine cuts here, but only four titles, each of them subjected to at least one remix. They range from a gloomy industrial shuffle on "Never Wonder Why" to searing, sample-slashed modern techno on "I.S.H. Revenge." But the differences between the mixes, whether tagged "chorus," "industrial," "radio," or "original," are so minute that *Round and Round* offers far less insight into Man's work than we might expect

from a 48-minute package. Still, there's more range and imagination in this bit of recycling than we've heard from most rave acts with more titles to their name. Under the name Shook Hands, ISH showed some impressive work on club playlists a couple of years ago. Come on, Man; let's hear more next time out.



Shaman, *Offering* (Shaman, Box 1395, Media, PA 19063).

The enigma begins with the song titles, each one a number whose relationship to the music is far from clear. The lowest of these, "Seven," is tagged to a piece that alternates 8/8 and 9/8. The more intimidating titles — "Thirty-three," "Seventy-two," "Twenty-one-A," etc. — discourage further detective work. Which is as it should be. This Philadelphia-based trio plays with an eloquence that no cold numbers can suggest. Percussion parts alternate between galloping beats, cymbal washes, and silence, to which synthesist/sound designer Joe DiMattia responds with a delicate ear and a fluid touch. His unaccompanied spot on "Thirty-three" begins with a Swiss clock-like sequence, then slowly unfolds into a filmy chord wash until Mike Merlino's and Michael Scott's drums shatter the sylvan scene like a stampede thundering before an oncoming storm. Imagine South African township drums in a new age setting, and you're close to *Offering*, an intriguing study in genre-hopping.

Jeremy Wall, *Stepping to the New World* (Amherst, 1800 Main St., Ste. A, Buffalo, NY 14208).

Though *Stepping to the New World* falls under the same E-Z jazz category decried in last month's Yellowjackets review, this album satisfies. The secret seems to be that modern jazz-rock is viable as long as you don't confuse it with bebop or some other fundamentally improvisatory form. Wall does improvise throughout *New World*, almost entirely on piano with perhaps a few synth touches; his solo on "Fly Away" reflects an exceptionally lyrical imagination. But his main strength lies in the twin disciplines of composing and arranging. His tunes are structurally solid, with each section logically connected to the next. On each cut, the band cooks, sometimes at a sensuous simmer, often at a searing burn. *New World* proves that it's no sin to be a mainstream player, as long as you've got the taste and vision to put your licks into a musical context.

Paolo Pizzi & Tomoko Ariyuki Pizzi, *Time (Elapsed) Art Music* (c/o Time (Elapsed) Art Music, Via Pietro Giannone 28, 00195 Rome, Italy).

In his ability to assemble virtuosic improvisers from unlikely backgrounds and guide them toward performances of singular focus, Paolo Pizzi follows in the footsteps of Miles Davis. But where jazz marked the common ground on which Davis gathered his troops, academic music, with vigorous cross-cultural touches, marks Pizzi's turf. In "Passage," soprano saxophonist Javier Girotto blows avant-jazz lines over Pizzi's Zawinul-like synth pads while Mohssen Kasirossafar taps bongo beats on a Persian *zarb* — somehow, it all fits together. Pizzi's "Electronic Studies" nod to the IRCAM school of synthesis, while never slipping beyond listenability. On much of the rest of the album, Pizzi scatters prickly piano lines against shimmering electronic orchestrations, all the while with a vivid coloristic ear and a respect for accessible melody. Tomoko Ariyuki Pizzi takes over on piano in two selections, the most impressive being her reading of six short but expressive solo pieces, collectively titled "Piano Music." Again, like Miles, Pizzi creates an overall effect of mystery; his music is elusive, impossible to categorize, and ultimately worth writing home, or even to Italy, about.

Various Artists, *Rockin' Eighty-Eights* (Modern Blues, Box 248, Pearl River, NY 10965-0248).

Blues is an archival music. Its masters are not necessarily those who innovate; more often, they're the ones who best conform to long-established performance convention. This package, featuring recent work by three prominent St. Louis blues pianists, makes this point clear. Each player — Johnnie Johnson, Clayton Love, and Jimmy Vaughn — walks the straight and narrow stylistic path. Voicings never creep beyond the occasional ninth, substitute chords are scarce, solos regurgitate the classic litany of pentatonic runs and minor-third trills. There's nothing new here — which means that these guys are authentic. Yet within this restricted framework, differences between each artist are impossible to miss. Love plays fast and loose with the sustain pedal, pummels triplets mercilessly behind his vocals, and seems unfazed by clinkers. Vaughn's solos stumble and weave in a fashion appropriate to the title of his last selection on the album, "Ripple Wine Dream." Only Johnson finds the pocket and stays in it (perhaps because it's his band that backs all three players). The longtime Chuck Berry sideman articulates cleanly at up tempos, and pumps the beat with a left hand more dynamic than those of his colleagues. That extra seasoning you get from chops as good as Johnson's only makes the meal tastier.

Me Phi Me, *One* (RCA).

Like blues, like early rock, like all vital styles in their embryonic state, hip-hop has survived critical condescension and matured along lines that emanate from its essential characteristics. This evolution continues gradually, though at times truly innovative artists execute conceptual leaps so dramatic and idiosyncratic that only the most closed-minded will fail to see that something important is happening. So it was with Public Enemy, and so it is now with Me Phi Me. On this album, unusually varied musical settings illuminate rap's poetic essence. Me's rhymes, mixed high and clear, span a wide range of moods, from the ironic idyll of "Black Sunshine" to the complex mix of sensuality, urgency, and innocence on "It Ain't the Way It Was." On each cut, the accompaniment follows Me's nuances, with traditional James Brown stabs followed by shimmering harp glisses over relaxed but very live-sounding drums. Sometimes Me's message is set starkly, with foot stomps and work-song grunts framing "The Credo" and contrasting effectively to a delicate orchestral segue into "Sad New Day." Later, in "(Think . . .) Where Are You Going?," the instrumentation breaks down to a single acoustic guitar, with backup sung by Michael Franks. Kudos to Me for taking creative chances, and to drum and keyboard player/programmer CeeCeeTee for making them work. ■

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Assembled by Robert L. Doerschuk.

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CAREER UPDATE

There's a new **Donald Fagen** album poised for release this fall. Though **Walter Becker** is producing the project and co-authored a couple of the cuts, Warner Bros. is careful to point out that this is a Fagen, not a **Steely Dan**, album. Fagen commuted to New York City for the sessions from his new home — **Bob Dylan**'s old house in Woodstock. . . . **Erasure**, with founding synth whiz **Vince Clarke** still at the keys, has been packing 'em in on their English tour; highlights included 15 nights each at London's Hammersmith Odeon and Manchester's Apollo. Plans for an autumn U.S. concert trek were being laid as we went to press. . . . **John Tesh** has been pumping albums out at an Olympian clip for his new GTS label. Future releases include *Ironman*, due in October, and *Love Songs for Christmas*, shrewdly slated for December. . . . **David Frank**, the definitive funk synthesist with the now defunct **System**, produces six songs authored by **Prince** on the next **Nick Nolte** film, *It's Only a Movie*, scheduled for release this fall. . . . **Ryuichi Sakamoto** is soundtrack composer and star of the upcoming film *Hollywood Zen*, directed by **Nagisa Oshima**, with whom Sakamoto previously worked on *Merry Christmas, Mr. Lawrence*. A new song by Sakamoto will be premiered at the World Paralympics, an event similar to the Special Olympics, in Barcelona during September. . . . The next **EMF** album is due in September, with a U.S. tour following. . . . **Tom Coster** releases his debut project for the JVC Music label on Sept. 8. Titled *Gotcha!!!*, it includes **Mark Russo** on bass, **Chris Camozzi** on guitar, **Alfonso Johnson** on bass, and **Dennis Chambers** on drums. . . . Congratulations to **Joseph R. Chmelik III**, a Navy communications officer stationed at Coronado, CA, and winner of the free Kurzweil K2000 offered in *Keyboard*'s May '92 Giveaway.

INDUSTRY UPDATE

YOUNG CHANG INCREASES LUMBER HARVEST. Young Chang America Timber, a subsidiary of the Young Chang Akki piano manufacturing firm, has opened a new lumber mill in Tacoma. This $5 million

AWADAGIN PRATT

A NEW LIGHT RISES ON THE CLASSICAL HORIZON

Pop culture is a meteor shower — a blazing flurry streaming through a vast, dark emptiness. Old meteors fade, new ones appear, then they too disappear, and the cycle continues, changing everything, changing nothing. Classical music, in contrast, is a star, gleaming dimly, sometimes hard to find but never quite out of sight, a glimmer of permanence in a universe of turmoil.

But if we zero in on this brave and lonely light, we see that the glitz and glare of pop culture have had their impact. Gone are the days when the giants of classical music conformed to certain expectations: Pianists and conductors wore tails, romantic virtuosi grew shaggy manes *à la* Liszt and Paderewski (or, in later years, followed the skinhead look of Heifetz and Rachmaninoff), and everyone said nice things about his or her colleagues. Nowadays, people who act like that don't get noticed. Headlines, and careers, often go instead to James Deanish rebels, nose-thumbers, or the frankly weird. Looking like Slavic punks certainly didn't keep Ivo Pogorelich or Andrei Egourov out of the headlines. And one wonders whether even so brilliant a pianist as Evgeny Kissin would be so huge without that New Kids pout.

Which brings us to Awadagin Pratt, the latest nonconformist in a field where conformity still hasn't quite gone out of fashion. From all reports, the 26-year-old Peabody Conservatory student tore it up at this year's Naumburg Competition. Jurors at this prestigious piano joust fell all over themselves in awarding him first prize and rhapsodizing his performance. His playing was described as "some of the most spectacular I've ever heard" by Ursula Oppens, and "like an airliner taking off" by Joseph Bloch. Since he has yet to record, we can only assume that Pratt is as singular a talent as these insightful observers say.

But if anything guarantees Pratt visibility, it is his non-musical attributes. For one thing, Pratt is an African-American, still a novelty amongst classical piano gentry. He sports a dreadlock 'do. In the fashion of his idol, Glenn Gould, he avoids normal piano stools, preferring to perch on the former lampstand he totes — disassembled — in a shoulder bag. He is, as an unnamed PR wizard said in a *Baltimore Sun* article on Pratt, "a publicist's dream."

Pratt is also a soft-spoken, low-key individual, with a clear view of who he is and where he is going. Rather than claim a fashionably multi-cultural perspective on classical repertoire as the son of a native of Sierra Leone, he insists that his musical upbringing was "strictly European. It was no more multi-cultural than, say, the upbringing of an Israeli pianist would be. Since classical music was what was mainly in my home, that's what I ended up liking."

Pratt grew up playing piano and violin; at Peabody, he is majoring in both instruments, and carries a third major as well, in conducting. For the past year and a half, though, he has concentrated on piano, in part to prepare for the rigors of competition performance. In his view, these preparations were no different from what he would go through to gear up for any typical concert. "You hear about some people who will only play straight in a competition, so as not to offend anybody," he says. "I can see how it could affect you to know that you're playing in front of a group of jurors who have certain beliefs, but that would always be ineffective for me be-

facility will boost the company's exports of North American lumber used for piano production.

ON DISK

NO CLIPPING HERE. John Cage's *4:33* is perhaps the perfect expression of a certain way of thinking in a certain school of music. After all, silence for four minutes and 33 seconds can be approached from a philosophical frame of mind. If that's your frame of mind, the new recording of the piece by British pianist **Wayne Young** may be just what you need. Produced by **Steve Long**, this reading for solo piano involves Young adjusting the height of his piano stool and lifting the piano lid, and all for a modest £5.29 — about $10 — on the CD. Asked how the Noise Abatement Society felt about this project, chairman **John Connell** offered, "I suppose the silent disc is the next best thing. People may like to give it to their neighbors."

BULLETIN BOARD

WEST L.A. EXPO. West L.A. Music's sixth annual Music Expo takes place Aug. 29-30 at the Los Angeles Airport Hilton. Highlights will include exhibits of new products by Alesis, Digidesign, E-mu, Ensoniq, Korg, Peavey, Roland, Yamaha, and other major manufacturers, computer music displays by Apple, IBM, and Atari, demonstrations by major music software developers, and appearances by major artists, including *Arsenio Hall Show* keyboardists **Michael Wolff** and **Starr Parodi**. Tickets are available at Ticketmaster outlets and at West L.A. Music; call (310) 477-1945 for further information.

COMPUTER MUSIC CONFERENCE. This year's International Computer Music Conference, scheduled for Oct 14-17 at San Jose State University, boasts a busy schedule of presentations of research papers, workshops, concerts, and auxiliary events. Highlights include classes titled "MIDI — Now and Future," "Digital Signal Processing Basics," and "Introduction to Compositional Automata," a talk

For end-table manufacturers seeking to break into the piano bench business, Naumburg Competition winner Awadagin Pratt may be the ticket they need.

cause I wouldn't be doing what I want to do."

Being true to himself guides Pratt on personal as well as musical terrain. "It's so important to be yourself," he explains. "That's why I never considered getting my hair cut. People have said to me, 'Look, what if you were going out and applying for a job, and the employer told you, "You'll get it if you cut your hair"?' Well, if somebody can't get past that, then they definitely don't want me for that job. Whether it's my hair, or my clothes, or something else, it would come up again at some time or another."

While not denying the notoriety his appearance gives him, Pratt maintains that he has already paid a price for his refusal to compromise on personal issues. "It's possible that more things might have come my way before the Naumburg if I looked different than I do," he muses. "There's no question that there are very conservative people in this business. I ran into this guy in the conducting program at Yale who made some snide remarks to me. I was asking him some questions about the program, and he said, very pompously, 'Well, we're all very serious here, as you can see. We have short hair and ties.' So, the next day, I left my resumé in his box with a note that said, 'As you can see, I'm very serious too.'"

In the years to come, Pratt hopes to expand his repertoire. Now grounded in what he characterizes as "heavy, traditional, Austro-German stuff," it will grow over the next few decades to include more contemporary works, including those by African-American composers. He also plans to frequently play and speak before inner city audiences. Not surprisingly, he intends to keep his integrity whole, notwithstanding occasional pressures from old-guard classical bluenoses to straighten up, get a trim, and sit on something sensible. But unlike some media marketeers, he knows that serving the music, not advertising his idiosyncracies, is the proper path to follow.

"People will go hear the Kronos Quartet, but can we get them to go and hear the Juilliard Quartet as well?" he asks. "My sense is that the public is looking for a change from what they've been exposed to, so the thing is to get more people involved in classical music. You can't just involve people in yourself. It's great if they support me, but it's also about supporting the arts. No matter what you do, you can't cheapen the music." — *Robert L. Doerschuk*

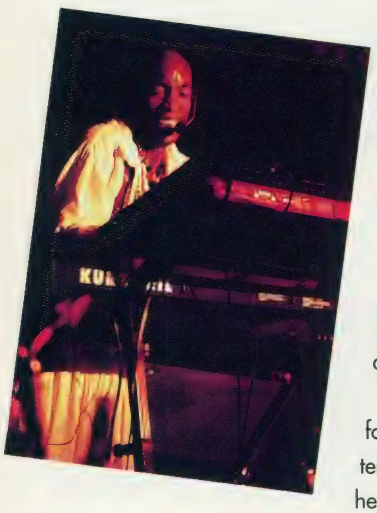
PHOTOGRAPH: ALGERINA PERNA/BALTIMORE SUN

by Max Mathews on "My View of the Future of Real-Time Computer Music," panel discussions on "Algorithmic Composition," "Embedded Instrument Programming Languages," and "New Venues and Media for Computer Music," a "cabaret concert" by Bruno Spoerri and Don Buchla, a "computer lounge lizard night" at a local dance club, and tours of the Wine Country and San Francisco. If you've got the bucks — $370 for non-students, $125 for students — and the endurance, get your tickets from the International Computer Music Conference, Drawer 104, San Jose State University, Music Dept., 1 Washington Sq., San Jose, CA 95192-0095; the number to call is (408) 924-4673.

EURO-MIDI NETWORK FORMS. Many of the various MIDI organizations that have formed throughout Europe in recent years have banded together in a new network, the European MIDI Association (EMA). Members of participating organizations will receive the umbrella group's bimonthly magazine, *MIDI Monitor*, and are entitled to telephone or fax assistance with any MIDI-related problem. Thus far, MIDI organizations in the Netherlands, France, Italy, and the U.K., as well as groups being formed in Yugoslavia and Sweden, have signed on with the EMA. Further information is available from EMA president Vic Lennard, c/o the United Kingdom MIDI Association (UKMA), 26 Brunswick Park Gar-

RUDY RICHARDSON OF THE BONEDADDYS

SURVIVAL OF THE FUNKIEST



Chances are, you won't hear their music on the radio much. And their videos haven't landed a spot on MTV's heavy rotation just yet. But despite suffering from a case of anonymity in the mass media, the Bonedaddys from Los Angeles are one of the biggest draws on the North American club circuit. Why? Call it a combination of hard work, perseverance, and a sound that's funky enough to boil blood.

Rudy Richardson is largely responsible for supplying the musical heat. Years of intensified gospel, jazz, and R&B gigs have helped defined his ultra-percussive keyboard style. "I cut my teeth in the black Baptist church," he proudly relates. But it wasn't until 14 years after he moved from New Jersey to L.A. in 1976 that Richardson landed his dream gig.

"I've been a Bonedaddy for nearly two-years now," he says with a grin. The band, however, has been burning for close to seven. Percussionist Mike Tempo, along with a group of his musical friends, founded the eight-piece band back in 1985, churning out a blend of West African and Caribbean rhythms. But the influx of new members over the years helped shape the band's current musical direction. "Today we're headed more toward a contemporary urban pop sound with an emphasis on rootsy rhythms," says Richardson. "There's a lot of house, hip-hop, and even acid jazz starting to happen. The idea is to bridge the gap between the early, rootsy style of the Bonedaddys and the more urban style of today."

Sometimes one Kurzweil just ain't enough: Just ask Rudy Richardson, shown here with a K2000 atop a K1000. A flock of Bonedaddys gathers on page 35. The foursome at left includes (clockwise from upper L) guitarist Marcus Watkins, guitarist Kasper Abbo, bassist Rick Moors, and saxophonist/flutist Jay Work. Playing totem pole at the far right (top to bottom): Richardson, drummer and bone necklace connoisseur Roderick Njoes, lead singer Kevin "Honey" Williams, and percussionist Tempo.

The band has been spreading its musical message the hard way — on the road, anywhere from 150 to 200 days per year. In doing so, they've developed a loyal fan base in over 50 North American cities. They've released four records to date (*A-Koo-De-Ai*, *Worldbeatniks*, and *Far Out Man* on Chameleon Records [1740 Broadway, 23rd Floor, New York, NY 10019], and *To Jam is Human, To Gig Divine* on Voss Records [1136 Patterson Rd., Oxnard, CA 93035]), but response at the cash register has been lukewarm at best. "A lot of us in the band have different theories as to why that is," says Richardson. "I think A&R people have had a hard time placing us in a category. In terms of the marketing aspect, they don't quite know what to do with this band. 'Are they an R&B band? A funk band? A world beat band?' No one can really put a label on what we do. We don't fit a specific format. I think it's going to take someone with vision — more vision, perhaps, than the average A&R person — to make things really start to happen for us."

How does a traveling eight-piece band survive tough economic times? "Well, number one, always take your wallet onstage with you," jokes Richardson. "But seriously, it's a struggle. You're always trying to stay ahead of the game. It's really your attitude going in, because you know that there are going to be a lot of sacrifices. The beautiful thing about the Bonedaddys is that we are a working band; in the past, we've been on the road continuously."

Perhaps another survival tip is to travel light. Live, Rudy wails on a relatively streamlined rig. "My main keyboards are a Kurzweil K2000 and a K1000," he explains. "The K2000 is incredible. I love the gospel organ patch and the pianos. I also have a rack with a Kurzweil horn expander, the HX1000, a Yamaha TX81Z, and a Yamaha mixer. Sometimes I'll bring out

PHOTOGRAPH: SHERYL KING GOLBUFF

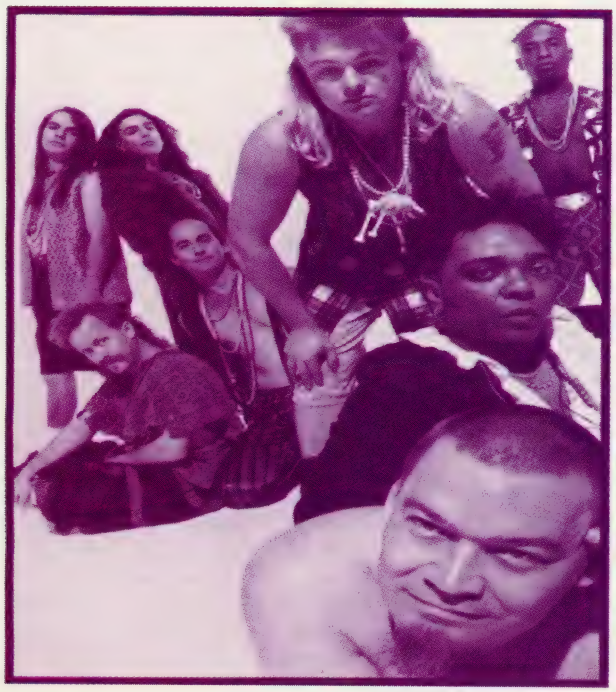
dens, New Southgate, London N11 1EJ, England.

USER GROUP GRAPEVINE. The International Sampling Cooperative is a new non-profit organization designed to facilitate exchange of non-proprietary samples and provide support for sampler users. The ISC currently uses the MUSO-BBS to dispense information and store samples in Sound Designer, Sample Vision, and Sound Blaster formats for downloading. Plans include launching a newsletter for members who use sampling but don't own computers or use modems, creating a database over which samples can be traded, and developing user groups with hardware-specific databases. For more information on the ISC or MUSO-BBS, write MUSO Information Services, 20929-47 Ventura Blvd., Ste. 293, Woodland Hills, CA 91364, phone (818) 580-7792, or fax (818) 883-0349.

ACCORDION MADNESS GRIPS SAN FRANCISCO. Two local organizations, Life on the Water and the Exploratorium, will cosponsor "According to Accordions," a city-wide series of performances scheduled for Oct. 13-18 and designed to celebrate the

my Roland D-50 as well. I'm not really a technician, as much as I'd like to be. I grew up as a player — a piano and organ player. So my main objective is to do just that. Occasionally I'll experiment with a few different sounds, maybe a marimba thing. But usually I'll stick to certain patches that I know are called for in the song."

Time will tell if the Bonedaddys can break the airplay jinx. At press time the band is self-producing a batch of new tracks at Mad Dog Studios in Venice, California. And, although they're footing the bill themselves this time around, there is talk of "a deal in Japan and Europe," according to Richardson. If the Bonedaddys' traveling circus doesn't swing through your neck of the woods sometime soon, be sure to catch their upcoming appearance on PBS's *Lonesome Pine Special.* —*Greg Rule*



CHRIS BURKE

THE DARKNESS BEHIND A THOUSAND POINTS OF LIGHT

During the Persian Gulf war, the American people demanded the right not to know. "Poll Backs Control of News," blared the headline of a January 31, 1991, *New York Times* article. "Given a choice between increasing military control over information or leaving it to news organizations to make most decisions about reporting on the war," the story informed, "57 percent of those responding said they would favor greater military control."

Chris Burke isn't surprised. "An independent study found that the more people watched TV during the Gulf crisis, the less they knew about the underlying issues and the more likely they were to support the war," he points out. Burke, 33, is a media hacker whose audio montages — dissected, stitched-together versions of press conferences, presidential speeches, and the nightly news — are pirate C-Span for Noam Chomsky fans.

Broadcast during Operation Desert Storm by New York's WBAI-FM, *Oil War* (cassette, $5.95, Arrest Records, 201 East 87th St., Ste. 22P, New York, NY 10128) indicts dissembling politicians, a press happy with the fit of its muzzle, and a citizenry high on jingoism and the joy of carpet-bombing. Dark billowing synths shot through with flickering strings hang like a thunderhead over the title track. Amidst the tumult of war-whooping anchormen — punctuated, incongruously, by cartoon boi-oi-oings and kah-blooeys — a deftly edited George Bush declares, "Our objectives in the Persian Gulf are clear: outlaw action and profiteering."

NOTES FROM the UNDERGROUND

On "New Technology on Trial," Burke contrasts a brooding classicism familiar from Danny Elfman movie scores with quick-step drum machine rhythms that bring boot camp into the discotheque. While snares and vocal samples stutter like belt-fed guns, military experts rhapsodize about F-15 Eagles and A-10 Warthogs. "Five hundred people were killed when the allies destroyed a Baghdad bomb shelter," notes Tom Brokaw, but why let grisly facts dampen the Super Bowl euphoria of the moment? As the Nintendo tagline runs, "Once you start playing, nothing else matters."

In the a cappella piece "New Word Order," Burke transforms the President into a ventriloquist's dummy. "This is the first assault in which the nations of the world can no longer count on East-West confrontation to stymie American ambitions," George Bush is made to say. "A new world order can emerge, a world where there will be a lasting role for a sound defense budget." It is virtuoso plagiarism, executed

Continued

venerable squeezebox. Festivities should reach their peak on Oct. 17, when all available players will congregate in the reverberant Exploratorium building for a massed performance, after which dancing to live zydeco music commences. Tickets are available at the Exploratorium store, 3601 Lyon St., San Francisco, CA 94123. Further details may be obtained by calling (415) 563-7337 . . . . If you can't make it to San Francisco in time for the October events, perhaps you'll still get your share of accordion action if you're around the 10th & Bryant Street ramp onto Highway 101. **Those Darn Accordions!**, the 14-piece guerrilla ensemble known for its "Lady of Spain-a-Thons" and other conceptual performances, have been designated official custodians of the freeway entrance and its surroundings in California's Adopt-a-Highway program. In that capacity, the group will devote several days a year to picking up trash there while serenading tourists and locals as they exit — flee? — the neighborhood.

VIRTUAL AUDITIONS. The Virtual Portfolio, a multimedia showcase designed to help corporate buyers find musicians and other artists for work on projects, will be released by One World Interactives this August. The work of more than 250 artists will be featured on this first release as 400+ megabytes of on-screen graphics, sound, and animation, all designed to run on a Mac II series computer with 5 megabytes of RAM and a CD-ROM player. Artists will be included in the portfolio on a per-megabyte fee basis. To participate in further editions of the Virtual Portfolio, write One World Interactives, 207 W. Fifth Ave., Eugene, OR 97401, call (503) 683-4020, fax (503) 683-3157, or reach via E-mail at oneworld@well.sf.ca.us. ■

NOTES FROM THE UNDERGROUND

Continued

with the surgical precision so beloved of Pentagon flacks.

"That piece," explains Burke, "was the result of a lot of information-gathering. When things began to happen, I started videotaping newscasts, which I later logged, transcribing key phrases. Then, using a Macintosh Classic running SoundCap by MacNifty, I sampled all of the phrases into the computer, editing them into long strings and laying them down to a Tascam 1/2-inch eight-track. The piece consisted of about five or six strings."

The M.C. Escheresque worlds within worlds implied by SoundCap's graphic editing capabilities inspired Burke's pointillistic studies in "creating textures by chopping samples into fine bits and reorganizing them" on *Idioglossia* (CD, Mode, Box 375, Kew Gardens, NY 11415). Droll as *Oil War* is doomy, *Idioglossia* exhibits a cockeyed, Ernie Kovacsish sense of humor and a winning way with cut-and-paste that nabbed it third place in the 1990 New Sounds Listeners' Poll on NPR.

In "Everything I Need," Burke lobs a grenade at Joe Cocker's "You Are So Beautiful" and calls the flying fragments art. "That piece began as a seven-second chunk of a song, sampled off the radio," recalls Burke. "Then, by cutting and pasting, reversing short portions of the sample and repeating others, I made sonic cells, maybe ten seconds in length. By saving them as individual files and then stringing them together in one big file, I created a deconstructed pop song. Using nothing but that one sample, I created rhythmic patterns and harmonics that are nowhere to be found in the original material. If you edit a sample down to the tiniest fraction of a second and loop it, you'll get a very different note when you play it back. Also, you can create amazing harmonic motifs by transposing pitches or mixing them together."

Burke, who also composes music for film and television, has just released *Not the End of the World, Darling* (CD, Arrest) and is currently at work on *El Patron*. The former, a collaboration with his brother Dan under the name Bloodbank, is techno- and acid house-influenced dance music for jellylike masses that move by pseudopodia ("We failed completely in our attempt at making the music danceable," chuckles Burke). The latter is *hörstück*, or aural drama, about Iran-Contra, its splintered narrative fashioned from sampled voices.

"*El Patron*," says Burke, "is the [true] story of a man who committed violent acts in the name of American foreign policy. It examines the media's role in the manufacture of consent for that policy. It's amazing to me that after all the Iran-Contra testimony, people still don't know what happened." —*Mark Dery*

Sample terrorist Chris Burke strums his Casio PG-380 MIDI guitar and plots his next assault on neolithic politicos. Behind Burke, at left, top to bottom: Alesis Midiverb and Roland TR-505, Opcode Studio 3, E-mu Proteus/1, Peavey DPM SX, DPM SP, Sony 3/4-inch video deck. Second stack: Alesis 3630 compressor, Akai S950, Roland Super Jupiter, Kurzweil 1000 PX. At far right, Tannoy studio monitor atop Soundcraft Series 600 24-channel mixer. A Yamaha DX7 peeps in at far left.

PHOTOGRAPH: PALLAS ATHENA

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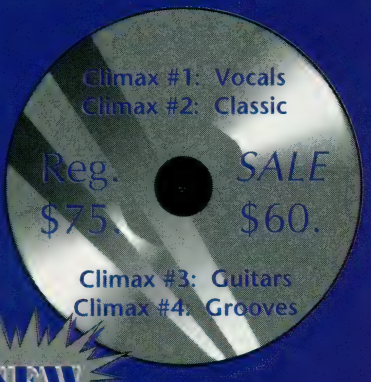

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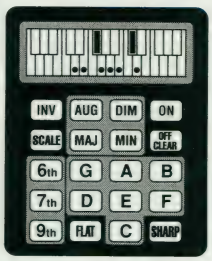

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TORI! TORI! TORI!

Armed With Provocative Songs, A Haunting Voice, And An Approach To The Piano That Got Her Kicked Out Of Music School, Tori Amos Launches A Sneak Attack On The Pop Charts

BY GREG RULE

Saturday evening, downtown San Francisco. Tori Amos has 600 fans nailed stiff to their seats. Alone centerstage, she slings a mane of red hair and writhes masterfully toward a double-encore climax. Tonight there are no glitzy costumes. No fancy effects. Not even a backup band. Just one woman, one piano, and a solitary shaft of white light.

This is music at its stripped-down, unpretentious best. It proudly

PHOTOGRAPHY: JAY BLAKESBERG

TORI!

raises a rigid, irreverent finger to inhibition. It minces no words, and it leaves few emotional stones unturned. From a whisper-soft, breathy sigh to a full-throated punch, it springboards from one dynamic extreme to the next.

Comparisons to Kate Bush and Laura Nyro are inevitable. Tori's introspective lyrics and sultry melodies conjure images of each illustrious predecessor; her voice, in particular, is hauntingly reminiscent of Bush's. But don't accuse this artist of following too closely in the footsteps of others. *Little Earthquakes,* her breakthrough release on Atlantic Records, cuts its own wonderfully distinct musical path.

Despite its anti-formulaic (and shockingly blunt) nature, the record has found widespread acceptance. Tori laughingly theorizes, "I think it's my hair color. People like red hair. And another thing is David Lynch, he's the same way. I'm embraced in certain areas: The press, television, and radio in the U.K. have been really supportive. But they don't have format hang-ups. In America there's this radio thing of 'Where do they fit? Tori, we don't know where she fits.'" Perhaps the only fit Tori needs worry about is the one her fans are having over her.

Backstage, after her San Francisco appearance, she disappears into a herd of enthusiastic admirers — signing autographs, posing for group snapshots, and fielding a barrage of questions. With pens and posters in hand, dozens more wait patiently outside the backstage door. Tori, against her concerned manager's wishes, charges happily into the crowd. All this after a sunrise flight, three interviews, two photo shoots, a soundcheck, and a sold-out performance. Next stop, San Diego. The early bird flight, no doubt.

Our day with Tori began with a cab ride through the downtown business district and a stopover at a renowned North Beach Italian eatery. There, over seafood pasta and wine,

CO-PRODUCER ERIC ROSSE

THE THREE LIVES OF LITTLE EARTHQUAKES

"The record was essentially done in three phases," says co-producer Eric Rosse of *Little Earthquakes.* The first batch of tracks ["Crucify," "Silent All These Years," "Winter," "Happy Phantom," "Leather," and "Mother"] were cut at Capitol Records in Los Angeles with Davitt Sigerson producing. "The piano and vocal tracks were recorded first, and then everything else was built around them." A 40-plus piece orchestra added layers of sweetening under the skillful guidance of arranger/conductor Nick DeCaro.

After hearing the first group of songs, the record company, surprisingly, balked. "They sort of pulled a Linda Blair," recalls Eric. "They came back and said 'What's this?' to this beautiful work." So Eric and Tori disappeared into Eric's home studio for phase two, which yielded the songs "Girl," "Precious Things," "Tear In Your Hand," and "Little Earthquakes." "It was the buck-and-a-half phase where money was really, really limited," laughs Eric. "Everything was pretty much done by the skin of our teeth. We used my old 3M 24-track analog machine, a decent commando-style Allen & Heath board, and a Yamaha CP-80 piano. We also went outside to a little place called Stag Studios, where they had a nice Yamaha grand."

For phase three, Tori jetted to England where she recorded several B-sides and the songs "China" and "Me and a Gun" (produced by Ian Stanley). During those sessions, Tori surprised her team of colleagues with an impromptu performance. Eric recalls, "One of the B-side cuts came together on the spur of the moment. It was a tune called 'Thoughts' and she wrote it as the tape was running, literally. We were getting sounds while she was doodling on the piano and I said, 'What's that?' So we just hit record and she wrote it in one pass." ■

the outspoken artist let loose on a variety of issues. The first was integrity.

"The whole music industry is so much dictated by radio, and who are they dictated by? Advertisers. It's a vicious cycle. And where does it stop?" She was getting visibly riled. "When will musicians stand up and say, 'It's not about being lucky enough to get scraps off the table.' It's not about, 'We're so lucky that you've given us a chance,' or, 'We'll do anything if you just let us play our music, you o masterful God, you.' Most of us are afraid to listen to our true voices because, 'What if we get dropped?' Well, so what if we do?!"

Every head in the restaurant turned as Tori slammed a clenched fist on the table. But she didn't seem to mind. The topic smacked painfully close to home. Just four years ago she experienced a major failure at the hand of poor guidance — a rock record called *Y Can't Tori Read* that dove straight to the bottom of the ratings bucket. A record that, in retrospect, she probably shouldn't have attempted.

But the now-28-year-old musician was resilient, battling a couple of years of mental upheaval before re-evaluating her direction and, ultimately, rediscovering her guiding light — the piano. "I finally brought myself to my knees and said, 'Wait a minute, when I was four years old, I didn't care what anybody thought.' There were no doubts about, 'Am I going to be successful?' I mean, I'd get my Shredded Wheat in the morning and play the piano and *that* was successful! I didn't think about people clapping. I didn't think about whether or not they liked it, and needing that from them. I trusted it. I know too many people who started off with these ideas but never followed them through because someone, at some point along the way, said, 'That's worthless.' There's a fine line between listening to everything and listening to nothing."

We listened to Tori, bug-eyed for two nearly two hours, as she recounted a series of colorful experiences. At times she fought to hold back tears, and, at others, vented frustration and anger. Through it all, though, she exuded a tremendous sense of warmth, compassion, and optimism — laughing and giggling openly, and often.

ON FAILURE

After listening to Little Earthquakes, *many readers will find your escapades in the rock world hard to believe. We understand you don't like to talk about it much, but we're curious to know what role that experience played in your artistic development.*

The band was together for about two years. We rehearsed three times a week and only played one gig. That's all we did — we stayed in the rehearsal studio, made a tape, got signed, and split up. As a writer, I didn't know what I wanted to express, really, at that point. I can say this now — I couldn't say it then — that I wasn't doing it for the love of music. I was doing it because I had something to prove to the boys who trashed me when I was 13. "We're not looking for this." "It's dated." "Do dance music." "Get a rock band." And after six years of rejection, I started listening to them. The positive thing is, I play the piano much differently today because of that experience. I led myself to believe that, because I'd been playing the piano since I was two-and-a-half, I could play anything. But that didn't mean that I was any good at it. That didn't mean it was coming from here [*she points to her stomach*]. If it's not coming from here, you smell it. There's nothing worse than seeing a kid play dress-up just to please Aunt Louise. It's awful if they don't do it because they want to do it. At that point in my life I was on auto-pilot. My self-worth was all wrapped up in whether or not this thing was a success. I didn't really consider the girl in all of this. I didn't understand that I was a girl until four years ago. I was just a musician who became very needy. That's the hardest thing with musicians, I think, is that we're so sensitive. We start listening to other people. How much can you take before you start asking yourself, "Maybe they're right?" How many years can you take it? Seven? Twenty? Two? You lose faith in what you're doing.

Did you honestly feel, when doing the rock thing, that you were

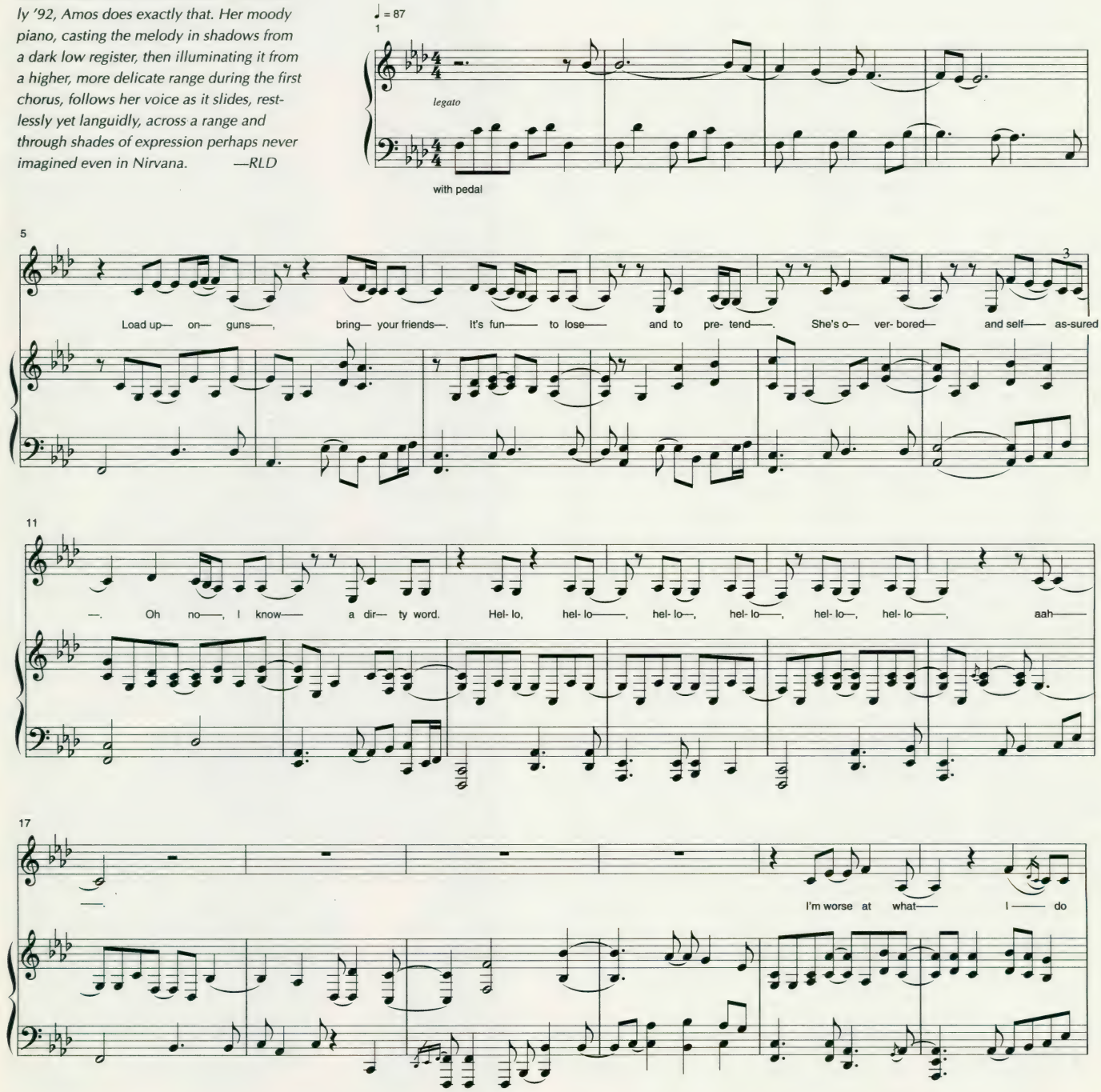
Text continued on page 46

"SMELLS LIKE TEEN SPIRIT"

AS PERFORMED BY TORI AMOS

FROM THE CD EP "CRUCIFY"

Nothing is tougher than to take a song stamped with another artist's identity and make it your own. Yet in her remake of Nirvana's thrash-rock hit from late '91 and early '92, Amos does exactly that. Her moody piano, casting the melody in shadows from a dark low register, then illuminating it from a higher, more delicate range during the first chorus, follows her voice as it slides, restlessly yet languidly, across a range and through shades of expression perhaps never imagined even in Nirvana. —*RLD*



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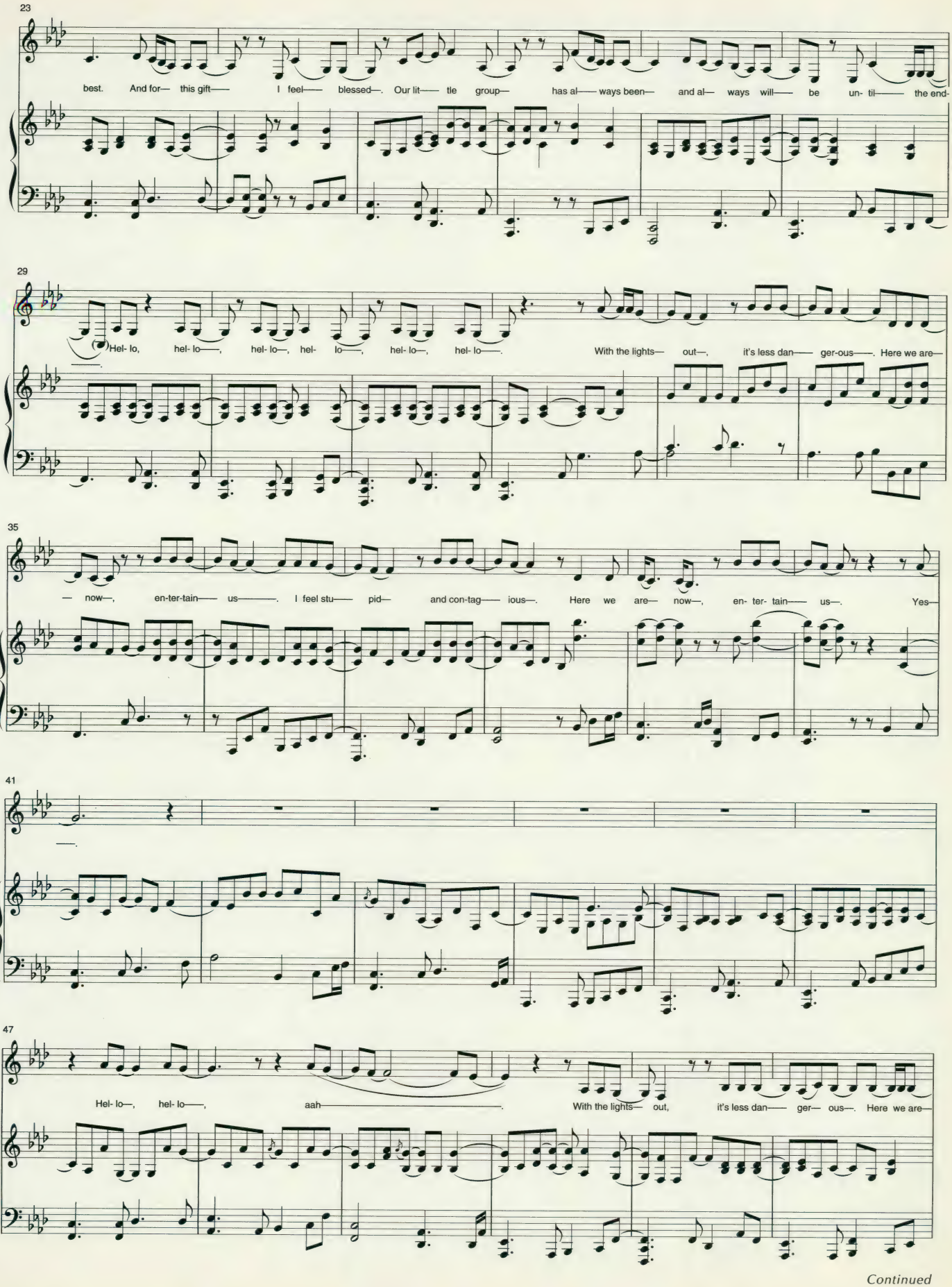
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best. And for— this gift— I feel— blessed—. Our lit— tle group— has al— ways been— and al— ways will— be un- til— the end-
29
Hel- lo, hel- lo—, hel- lo—, hel- lo—, hel- lo—, hel- lo—. With the lights— out—, it's less dan— ger-ous—. Here we are—
35
— now—, en-ter-tain— us—. I feel stu— pid— and con-tag— ious—. Here we are— now—, en- ter- tain— us—. Yes—
41
47
Hel- lo—, hel- lo—, aah—. With the lights— out, it's less dan— ger— ous—. Here we are—

Continued

TORI!

Continued from page 43

on the right track?

You bet I did. I wouldn't talk to you about "Me and a Gun" [*from* Little Earthquakes, *the haunting revelations of a rape victim*]. As far as I was concerned it didn't exist. And if you wanted to talk to me about my Christian guilt, I would tell you I had none. I was adamant about what I was doing. I was defending it with every cell in my body. And I wasn't going to expose the part of me that could get cut up. What I didn't realize was that I wasn't immune to getting cut up, no matter which part of me I was showing.

The big one for me was when I started to need the approval of my peers. I think when you grow up and you get used to people applauding you, well, when the applause dies down, that's when you notice. It was, "What am I doing wrong?" instead of, "Maybe they're not getting it, so what?" And this festered for so long, and it became more desperate. "I'll try anything to get that back." You can't put a Band-Aid over open-heart surgery, you know. And while this infection festered, I put Band-Aids over it because I refused to accept that, "No, there's another plan for you."

This story for somebody might be, "Jesus, girl, get over it. There are real problems in life." Well, for me, that was my tragedy. A death of anybody close to me was nothing like that, because I had a part of me that was getting beaten in the corner; that expressive side was degraded, was forced to do things, was not loved. I'm a very cruel jailer. And I was. So when *Y Can't Tori Read* came skipping down my way, it was just the final thing of many, many, many things that I had done that ultimately got me back to the piano where I could lay myself bare. That record wasn't about "Was it a good record?" or "Was it a bad record?" It was the final thing that made me realize I had to do music for the mere expression of it. It didn't matter if anybody listened. It taught me to not be afraid of exposing myself. And if people wanted to piss all over it, then I'd just let it drip off the tape.

THE CHILD PRODIGY

My mother says I was playing at two-and-a-half. In fact, my earliest memories of life are of me playing. There was an incredible sense of pull and draw. That was my friend. That was my best friend in the world. That was the only thing that understood me and that I understood. I remember having an incredible understanding of the universe. I didn't have fears. I believed that there were mon-

"SMELLS LIKE TEEN SPIRIT"

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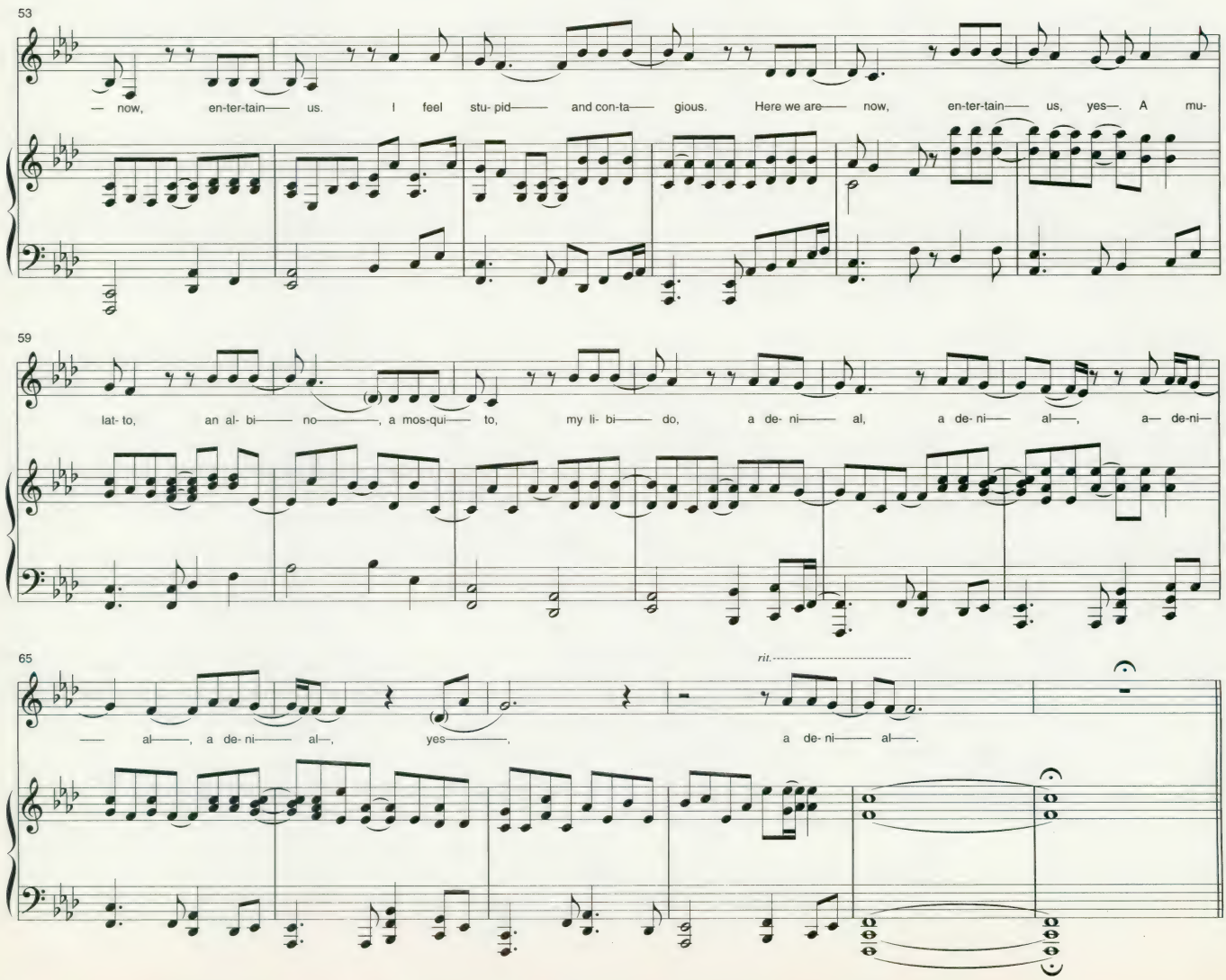

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TORI!

sters. It didn't bother me. They were just part of the room. They weren't a bad thing. I believed in other dimensions. And it wasn't just a Christian world to me. I felt good vibes from Jesus, but I also felt good vibes from Robert Plant. When you're young, you're being told what to think. But I'd go to the piano and that's where I was comforted. It was my protector, the protector of my thoughts.

Did you study piano formally at that age?

I entered Baltimore's Peabody Conservatory when I was five, and the idea was to become a classical pianist because what are you going to do when you can play like that? So the conservatory was downtown where there were *real* musicians. "Wouldn't it be great for her to be around real musicians instead of just going to first grade?" You're five, and you think you're going to be around older people. It's a very exciting prospect.

How did you feel about your gift back then?

I knew I was different. I knew I did things that other kids didn't do. But, you know, you don't have an ego when you're five. I didn't want them to treat me like I was weird or special. It would be really great if other people did what I did and we could just hang out. You just want to have friends and play and eat popcorn together. And life is very simple. You get inspired, it's very exciting. It's not about, "When Debbie was your age, she was three months ahead of you."

I was an ear person. And it was the way they taught me that was the mistake. They started me with "Hot Cross Buns." When you go from Gershwin to "Hot Cross Buns" it's a bit of a shock. You don't understand that this is for your good. "How could it possibly be for my good?" There's nothing that you could have said to that girl to convince her. She had no desire to do that. "I play because I love to play." You think you're being punished.

What I really learned from the Peabody came from my classmates. I got the music through them. I understood that there was a Jim Morrison and I understood that there was a John Lennon. They spoke to me like I was an adult. Here I was with my little curls, my feet that didn't touch the floor, and we're all sitting in theory class. And I'm turning around going, "Wow, he's really cute, and he's black, and he has long hair. Can I go home with him?" *[Laughs.]*

By eight, the bottom started falling out. They were looking for improvement and I wasn't improving. "What's she doing?" I was going home and listening to Beatles records and anything else I could get my hands on. I studied 30 minutes during the whole week of what I was supposed to. It was, "I'm here, and they don't get it, and that's the way it is." You just do that as a kid. You can't say, "Hey, let's have a conference." I was out by the time I was 11, because I was developing my own music all this time.

At 13, my father saw me wasting away, some of my friends were getting pregnant, and he didn't want that to happen to me. So he tried to find a special interest to keep my hands busy, I guess. He said, "Your music was so much a part of your life. Why don't you go back to the Peabody?" So I actually auditioned to get back in. These girls were auditioning for the voice school, singing *Ave Maria*. Me, I sang "I've Been Cheated" *[laughs]*. They didn't clap, and they certainly didn't let me back in. So I started played clubs and turning in my songs.

I heard something a few months ago from a period when I was 13 to 17, and some of it was so exciting. I'd forgotten. They're a bit

more progressive, honestly, than what I do now. I hadn't been diluted yet. I'd be proud to play you some of that stuff, especially when I was 16. Real exciting changes, no traditional choruses like you hear today out of my work. At that time it was completely about self-expression. It wasn't about, "What will they think?" What happens to a musician is that you either become a teacher, you become a church organist, you do your own music, or you play somebody else's in a lobby somewhere. . . .

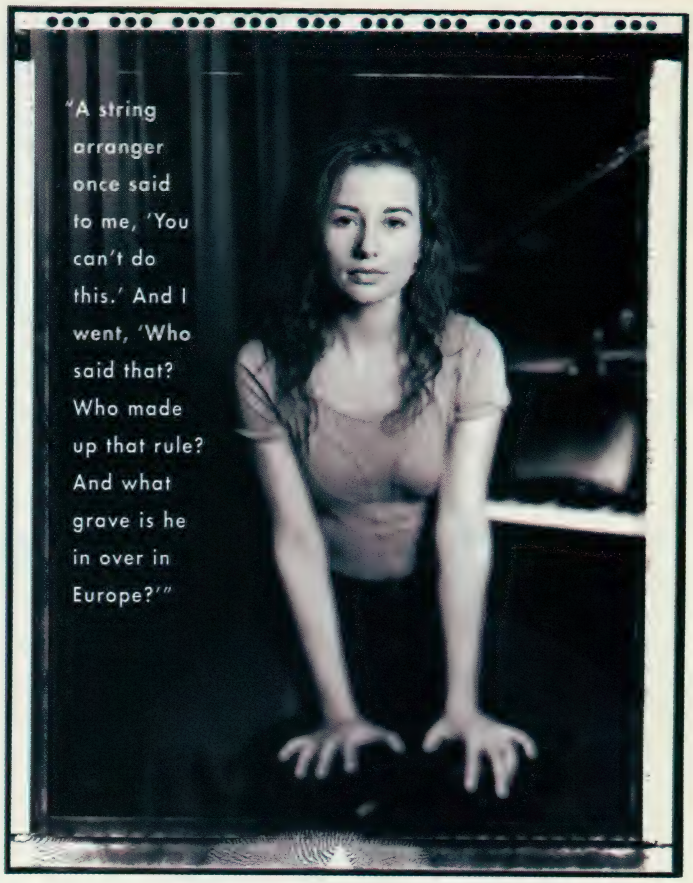
Which you did plenty of. . . .

Oh yeah, I wasn't going to be a teacher.

THE PIANO

I wrap my arms around the piano and embrace it. I see the piano as a living being. When I went back to it — after having my little explorations through the swamps and forests, and picking up a few bug bites along the way — I brought back new things. I brought back a new rhythmic sensibility and an overall sense of awareness. Playing all those Gershwin tunes in lobbies taught me what not to do. It really freed me up. I feel like the piano hasn't been explored to its full potential. I'm not talking about synthesizers either. I mean *really* working with the acoustic instrument. I started to approach it as something that has its own consciousness. It thinks. We collaborate together. It's not like master and servant. At times — and we're all guilty of this — you start whipping your instrument. Domination. Not that I don't like domination. But when it comes to the piano, it's not going to work unless there's give and take.

I've never considered myself to be a great player. I'm just a really creative player — voicings and all that stuff. I play from here [*pointing to her stomach*]. I've never had the chops like the killers. You know, you walk in and see the killers playing Chopin and yadda, yadda,



TORI!

yadda, and you just go, "I'm impressed." And, to some extent, it is impressive. But from a very different place. Some of them play from their stomach and have the technique. But not a lot of them. Back in school, I would always say, "How do you know that Debussy meant this? Because I certainly don't think Jesus meant this when he said such and such." When people talk about interpretation of a piece, I completely lose it, because again, it's that intuitive place of respecting the instrument and respecting the song. Music, it has an opinion. But yet because I'm different than you, I have every right to play "Claire de lune" my way, as do you. Why should you play it like me? Maybe you're coming from a different background with a different edge that brings it a different perspective. I don't believe for one minute that Debussy would not want to hear your perspective! I don't believe that. I'd love to hear someone's perspective on one of my tunes.

There's no doubt, though, that the classical influence has seeped into my brain, obviously. But [*at the conservatory*] people weren't encouraged to think for themselves. That's what we're missing. And not just in music — how to be your own thinker. Give the kids tools, so they can go build their own houses; not the blueprint of what the house should be.

Getting back to the piano, though, there's a certain respect that I have to approach it with now. If you're not careful, you tend to approach your instrument very lazily. As I play alone at the piano, I have to honor it. I have to know that it is speaking, too. Every night it shows me something different about the song I played a hundred times before. I never play a song the same way twice, like a lot of people do. It also gives the impression that it's a very passive instrument when you think of a singer/songwriter at the piano, besides someone like Jerry Lee Lewis. But if you're not in the band scene, you don't get the same power or electric feeling that you do from guitars or drums. I see the piano as a real powerhouse instrument, and it can be very edgy. I feel this vibe from it. It speaks to me all the time. That's where the line "There are pieces of me you've never seen" [*from the song "Tear in Your Hand"*] comes from. That's the essence of what piano is. The piano is a living essence. "All they think I'm good for is a nice black dress." So I'm starting to explore different things with it.

For the next record, I want to work with this instrument exclusively, not synths with it, but the acoustic piano alone. It could be percussive, or it could be orchestral, maybe it could have effects. There might be solos. I'm finally claiming that this is my instrument. Because I can hear what it is saying to me, I have a responsibility to listen to what it's saying to me. And now it says, "I have some really good ideas and you're a human, and you could take them down for me — if you can get your own stuff out of the way to respect the fact that you're not the only one who's got ideas." I've really become very close to it now.

ON SONGWRITING

I could tell you any load of rubbish about the way I write. The truth is, I really don't know. Each song [*from* Little Earthquakes] came together in a completely different way. What I can say is that, generally, when I'm writing, things start to flow. But still I have to craft it. It's like I have this hunk of clay in my stomach that I'm conceiving. And it's telling me what it wants to be. But I have to put it into a language. I hear it in my head and in my stomach, but the key is translating it into feelings and words. You can taste something, but try and put that taste into words. You have to bring in forms of reference. If

you've never had a papaya, well, it's kind of like such and such, instead of actually experiencing the papaya.

With this record, a song like "Silent All These Years" has a certain story line going on musically that's really the antithesis of what's going on verbally. It's counterpoint, pure and simple. But instead of French horns and cellos or something, it's words and music. And I find it very exciting when an acoustic instrument has its knife out. It can take on these different roles. The idea of being a woman . . . you come over to my house and I'm serving a fruit plate. That's not always going to happen. Especially if somebody isn't being polite, or if somebody's being a dick. Then I'm going to put the peelings on the floor and watch you trip, and giggle. And that's the same with the acoustic instrument. It's not always just about, "I'm vulnerable, I'm sad." There are many different sides, and the beauty comes in exploring them.

He [*pointing to co-producer Eric Rosse, across the table*] was there when some of the songs were being written. "Mother" was written at 6:30, 7:00 in the morning. We were on a futon in the little place I had at the time in Hollywood, and I got up really early and started meandering on the piano. I meandered for about 25 minutes and I started to get this . . . [*hums the intro to "Mother"*] . . . and I hear this voice from the futon, "What's that!" And I said, "Oh, it's shit. Forget about it." And he yells, "Play it again!" What happens with each one is that there will be a word that comes with the melody. Then a bridge section will start to work and I'll know it wants to be there. And then maybe I can't figure anything else out, so I'll put it aside. Three months later, I'm walking down the street and I'll come up with four notes, and that's what I'm going to build the next section on.

Do you write your ideas down on paper before putting them aside?

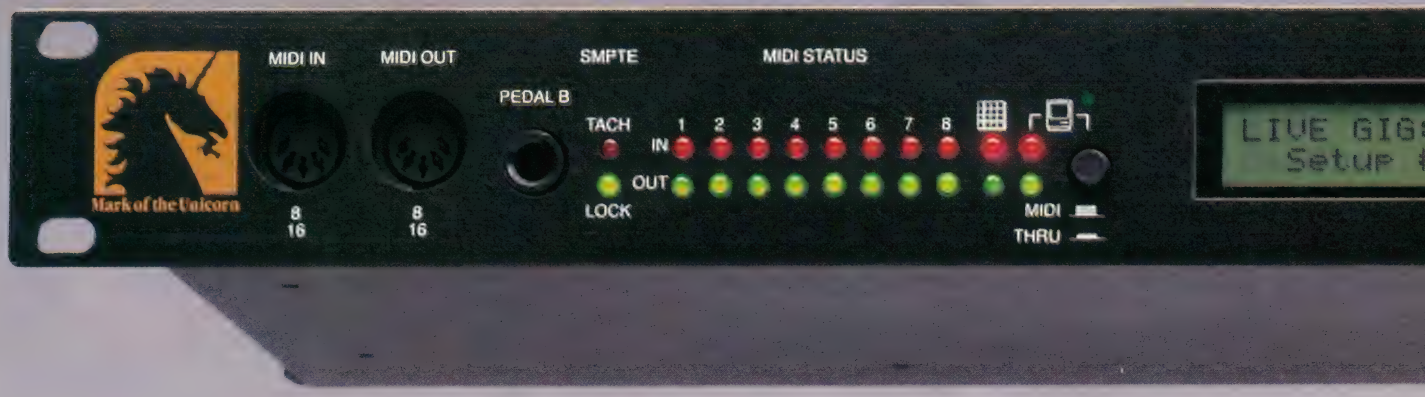
Well, I'm not very good at writing things down sometimes. Maybe it'll be on the back of an envelope, a bill, a magazine, or I might record it on a ghetto blaster.

Do you ever wake up in the middle of the night in a cold sweat and run to the piano with an idea?

Hot sweat, yeah. Sometimes. But then there are times when I'll have the greatest ideas and I wake up in bed and I just go, "I'm too tired." Then I forget. But besides all this intuitive stuff, you train yourself on what works and how it works. And again, it goes back to that belly thermometer. If you learn to accept the first thing that comes to you, then you can't be objective. I listen to a lot of music and I read a lot of books and I know something great when I hear it. It just has a level of greatness and you know it. I can argue almost anytime why it is and isn't. But I can't tell you why it works. All I can do is just throw my hands up in the air. And it doesn't matter whether it's up my street or not. I can acknowledge it if it works. Again, it's that thing in your belly. You know when the jam isn't happening. You know when it's too runny. And if somebody says, "Well, some people like runny jam," well fine. I'll give 'em mine then. But let's be right. Good jam is good jam. And so when you hear something. . . . When I heard the Nirvana piece [*"Smells like Teen Spirit," which Tori covers on her new EPs* Crucify *and* Winter — *see p. 44*], I had never heard of the band before. I was in Sweden in the outback freezing my ass off in the fall, I wasn't keeping up on stuff, and I saw their MTV up there and immediately I was going, "I've got to write this down." That melody was just something that said, "Take me to the piano."

Anyway, with my own stuff, I know when it's not happening because I have pains in my stomach when it's not. I guess I'm real lucky for that. When a mix is up and I have to run to the toilet, there need to be no words said. You can't just walk out of the studio because you're ill. And I think that when you have so much love for it, it just affects you like that. The other thing is, I'll go, "I'm going

Continued on page 147



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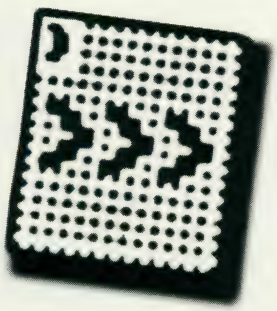

Like many computer-based sequencers, C-Lab Notator is so jam-packed with features that you can use it for years without a hitch, and yet never tap its full power. In this clinic we're going to assume that you're familiar with Notator's basic features, and that you have at least cruised through the manual. After using the program for a few months, you might find it useful to spend an evening simply reading through the manual while sitting in front of the computer. You may find some short-cuts and procedures that will make a lot more sense now than they did when you were first learning the software.

Think of this article as a supplement to the process of going back through the manual, or as steering you toward particular sections of the manual that you may want to take a closer look at. If you're not a Notator user and want to learn more about it, this article should help you get a better feel for procedures that you probably won't encounter in a typical in-store demo.

Phil Shackleton is a composer, arranger, and producer in the Los Angeles area. He teaches composition and electronic music at Azusa Pacific University in Azusa, California, and is the author of an introductory book on Notator (Alexander Publishing, out of print).

BY PHIL SHACKLETON

Just Say NOTATOR

PRE-DEFINED GROOVES

Grooves are a way to quantize to rhythmic patterns that aren't based on a single rigid rhythm value. Notator has built-in grooves for eighth and sixteenth swing feels, as well as for music that mixes duple and triple subdivisions of the beat and music that uses less common subdivisions. The built-in grooves (see chapter 17.2 of the manual) are accessed with the right mouse button in the track window. Swing grooves are from 8A (same as eighth-note quantization with no swing) to 8F (lots of swing) and 16A to 16F.

Both of the hybrid grooves (8-12 and 1216) require reasonably accurate playing to begin with; the computer can't read your mind when it tries to tell which type of quantization, duplet or triplet, to apply to a given note. Because Notator's display quantization is separate from the playback quantization, you may see a passage displayed as dotted eighths and sixteenths even when the second note in each beat was quantized to the third triplet using a hybrid groove. So play carefully, and listen carefully after quantizing and check the note times in the edit list to determine the actual positions of any notes you aren't sure about.

The final built-in groove, Free, is related to the sixteenth swing grooves, but allows you to play subtle variations of sixteenth swing, from rigidly straight time to fairly swung, in the same phrase or track. The Free groove can be used anytime you would have used normal sixteenth quantization, as long as you're happy with the looser placement of the second sixteenth-note in each pair. If you want to use a Free-type groove with eighth-notes, you can construct it yourself with a user groove.

USER GROOVES

Any track can be a user groove template for any other track, up to a limit of 16 definable user grooves. With this feature you can do things like quantize a bass part to a drum part, make two rubato parts play together more tightly, and so on. You can construct tracks that aren't meant to be heard, but which serve as "feel" templates for other tracks.

To define a user groove, you need to do three things: Construct a template track, define that track as a particular groove number (from Us1 to Us16) by selecting Set Groove Parameter in the Quantize menu, and finally select that groove for your chosen track by clicking on the track's Groove playback parameter.

In constructing a track strictly for template purposes, remember that it can be looped. You may need no more than a single beat (or bar) in the template track. To make an eighth-note version of the Free groove, select an empty track, enter the edit screen, and enter a note at 1 1 1 1, followed by a note at every possible time from 1 1 3 1 to 1 1 3 33. (Here's a short cut: Instead of dragging 32 note messages onto the list, use Segment Copy in the Copy menu, and copy a segment that's a single tick long. After placing a note at 1 1 3 1, use Segment Copy with the left limit set to 1 1 3 1, the right limit to 1 1 3 2, the "to position" to 1 1 3 2, and the number of copies to 31.) Go back to the Track display and loop your new track with a value of one beat.

The power in user groove templates is that you can tweak the locations of notes in your template track (and/or the range and strength parameters in the Set Groove box) until you hear exactly what you want. After doing such an edit, you need to return to the track that is being grooved and press G. This tells the computer to apply the most recently accessed user groove. You will then be able to hear the effect of your template edit on the grooved track.

If you need part of a track to fit a different groove (built-in or user) from the rest of the track, set the main groove first. Then use the Process Data screen (choose Process Data from the left side of the Functions menu). Choose a groove and your left and right limits, switch both the groove and the limits on, and click on OK. This process can also be used to de-quantize part of a track: Simply set the quantize value on the Process Data screen to 768 (or 1536, if you're running at the higher clock resolution). Again, set the left and right limits for the part you want de-quantized, and switch the limits and quantization on. De-quantizing single notes is even simpler; select the note on the edit screen, and press <SHIFT> Q.

Even if you want to quantize to standard sixteenth-notes, you might find it more musical to define a user groove in which the template track has a block of notes a few ticks before and after each mathematically perfect sixteenth. By using this template, you create a "window" in which notes won't be moved at all if they're close to the beat, while notes that are farther away will be moved close to the beat but not onto the beat. This is a subtly different effect musically than quantizing notes by a percentage using the Capture Quantize feature. Capture Quantize moves all notes by a selected percentage if they're already within its window, while the type of user groove described above will move any notes outside the window into the edge of the window, but won't affect any notes that are already within the window.

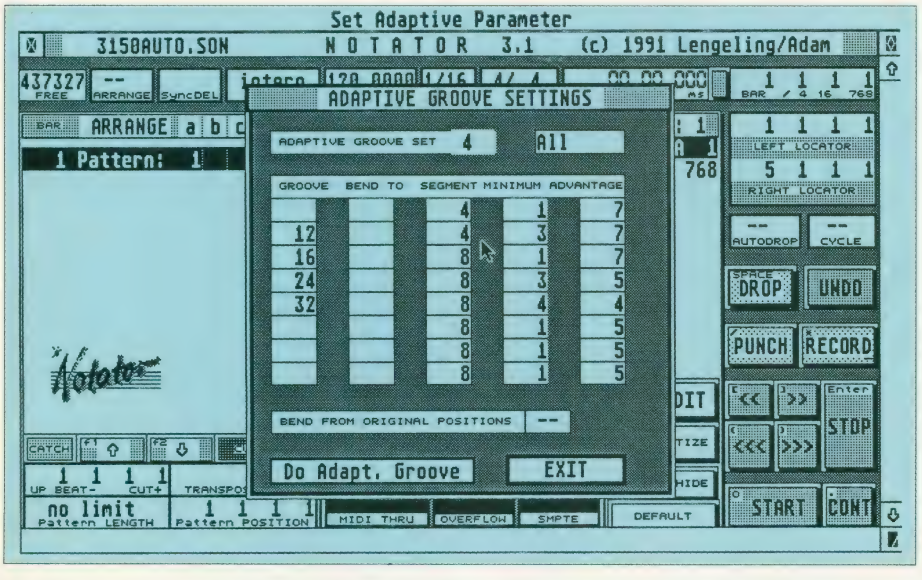

Fig. 1. Notator's adaptive groove dialog box (center of screen). The quantization values that will be used by this adaptive groove set are in the column at left. The number of notes that must be present in a group in order for Notator to choose a given quantization value is given in the "minimum" column. When a group of notes could be quantized in several different ways, Notator looks at the "advantage" setting to see which type you'd prefer.

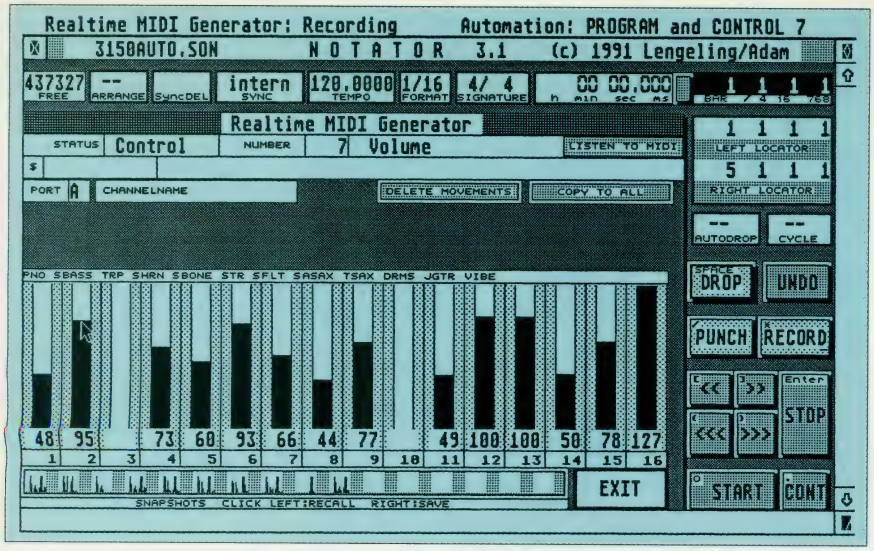

Fig. 2. Notator's Realtime MIDI Generator provides 16 software faders. These can be grouped by clicking on the small numbers below the faders, after which the entire group can be adjusted as a unit. Snapshots are stored and recalled by right-clicking and left-clicking on the small icons in the bottom row.

Remember, none of these procedures results in permanently altered data. You can quantize or groove every track in your song, save it to disk, come back six months later, and recover the original performance of every track.

ADAPTIVE GROOVE

There's still no such thing as a computer that can read your mind. But Notator has an advanced quantizing function that tries to do just that. By programming an adaptive groove (see chapter 17.3 of the manual) to correspond to the playing style of a particular part, you can correct the rhythms "intelligently" even if you've mixed duple, triple, and other tuplet values, straight time and swing. With an adaptive groove, you tell Notator what time values to expect in a particular track. It then corrects the rhythm of each beat based on its best guess about what you intended to play.

Seven adaptive grooves are included in your AUTOLOAD.SON, which is loaded each time you start Notator. These can be edited to fit your musical needs. Choose Set Adaptive Parameter in the Quantize menu. You'll see the dialog box shown in Figure 1.

Up to eight lines can be defined within each adaptive groove set; lines for which the left-hand column is blank have no effect. In the left-hand column, you choose a type of quantization (including a user groove). The other four columns control when and how Notator will use this quantization.

The setting under "minimum" tells Notator how many adjacent notes must have a rhythm similar to the type found in the groove column before the note group will be identified as having that groove. A minimum of 1 is the same as switching off the minimum setting. The "segment" setting controls how large a window Notator will use to "look for" that group of notes. In Figure 1, the first defined line means, "If 3 or more notes (minimum) appear in the space of a quarter-note (the segment), quantize them as eighth-note triplets (the 12 setting under 'groove')."

The "advantage" parameter, which can be set from 0 to 10, is used to tell Notator which grooves are more likely to appear in your music. In cases where it could choose between two or more possible grooves for a group of notes, it will choose the groove that has the larger advantage. In Figure 1, the advantage for 32nd-note quantization is lower than the advantage for sixteenth-note triplets. As a result, if four notes are present within an eighth-note segment but your playing is a little sloppy, Notator will tend to assume that you meant to play triplets rather than 32nd-notes. (The fourth note will be quantized either as part of a two-note chord, or on the next beat, depending on where it falls.) Because the minimum for 32nd-notes is 4, if only three notes are present within the eighth-note segment, Notator will always assume that you meant them as triplets.

By carefully combining your user grooves in adaptive groove sets, you can get quantization that is fast, customized, and more human-sounding than mechanical. Adaptive grooves are saved with the

DID YOU KNOW...?

- To hear the desired sound when recording a track that you want to be layered on more than one MIDI channel, assign a ghost track to the new track before you start recording.
- Keypad commands for start, stop, continue, and record are all active in the edit screen. To move forward or backward one bar at a time (whether or not the music is playing back), press the left or right bracket key.
- To move the notation or HyperEdit display forward or backward through the track by single bars, use the parenthesis keys in the keypad section at the right side of the computer keyboard.
- To see bar numbers (and time signature changes) in the edit screen that correspond to the bar numbers in the Arrange list, select "global position" in the Edit menu.
- While editing a looped track, you can toggle back and forth between two different edited versions without stopping playback by pressing the Undo key.
- Any track can be looped to a fraction of a beat by editing the time of the track loop marker as if it were a note.
- To avoid undesirable changes in the length of notes when transposing a track, transpose up or down by three octaves or so and then back down to the required point.
- If you're doodling on your synth while listening to playback and you find a phrase that you like, don't hit the stop button! Instead, select an empty track and press <RIGHT-SHIFT> <RETURN>. Notator is always recording what you play, even if you haven't hit the record button.
- Macros (chapter 3.2 of the manual) are a great way to enter often-used track names like "Bass" and "Melody." Create them and store them in your AUTOLOAD.SON.
- To scroll duration or time values in the edit list by tens, press and hold one mouse button (to establish the direction you want to go) and then press the other mouse button.
- You can flip-flop your left and right mouse buttons for most edit operations by pressing <SHIFT> Z. This will cause numerical values to increment with the right button and decrement with the left button.

Just Say NOTATOR

song, and can be loaded into another song at any time using the Load System command in the File menu.

REAL-TIME MIDI GENERATOR

The RMG (see chapter 22 of the manual) can function as an almost totally self-explanatory set of faders for MIDI volume control (or any other continuous MIDI data). It can also provide faders assigned to "pseudo" MIDI data (P_USER events), including tempo changes and sys-ex transmissions. While all types of faders generate data, only those assigned to volume, program changes, and certain types of P_USER data respond visually to data already recorded into a track.

To enter the RMG, click on the RMG button or press M from the main screen. Your screen should look like Figure 2. If you don't see the word "control" in the status box, left- or right-click until you do. If you now put a value of 7 in the number box, the RMG will be a MIDI mixer for 16 channels. (The faders are numbered.) You can move the faders while listening to the music, change the numbers directly, or even type them.

If you want the volume levels recorded in your song to be played back correctly when you start playback in the middle (called "chasing" volumes and program changes), you'll need to record the RMG volume data into a track that runs the whole length of the song. Volume data (or any other RMG data) for all 16 MIDI channels can be recorded into a single track; to record new data without erasing the existing data, right-click on the RECORD button to start recording.

The faders can be grouped. Just click on the fader numbers and move any of the grouped faders; they'll all move. Ungroup them the same way. You can save (right-click) and recall (left-click) up to 16 snapshots of all 16 faders' positions in the small boxes at the bottom of the screen.

When you leave the RMG, you'll see that the MIDI channel of the track into which you recorded RMG data has been changed to "original." This is because Notator can support up to 16 channels of data in a single track. Since the track's channel assignment takes precedence over the channel of the data itself, the RMG has to change the track to "original" in order to record controller data for more than one channel and have it played back properly. A side effect of this is that when you enter the RMG, the sequencer's MIDI thru will no longer rechannelize your keyboard's MIDI messages. You may need to change the channel on which your controller is transmitting in order to match the sound source, if you plan to play notes while using the RMG.

The DELETE MOVEMENTS button removes all instances of the currently selected fader's data within the track, if you click the button while the sequencer is stopped. To delete only a portion of the selected fader's data, right-click and hold the DELETE MOVEMENTS button while the sequencer is running.

If you left-click in the STATUS field a few times, PUSER will appear. Between this area and the sliders, you'll see some new data fields, as shown in Figure 3. These can be used for recording short sys-ex strings. (See chapter 22.11 of the manual for how to do this.) You can even click on LISTEN TO MIDI to

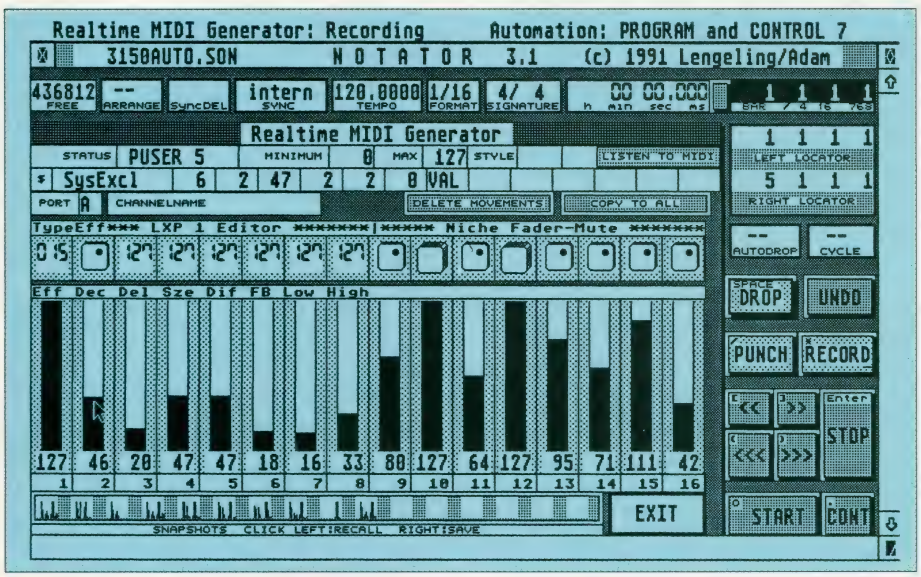

Fig. 3. When a pseudo/user event is selected for the RMG, an extra row of buttons and/or numerical readouts appears. In this mode, you can send Notator a short sys-ex packet, and it will store it in the "SysExcl" row. Send it several examples of the same packet, and it will figure out which byte (shown on-screen as "VAL") is variable and should be assigned to the slider or numerical readout.

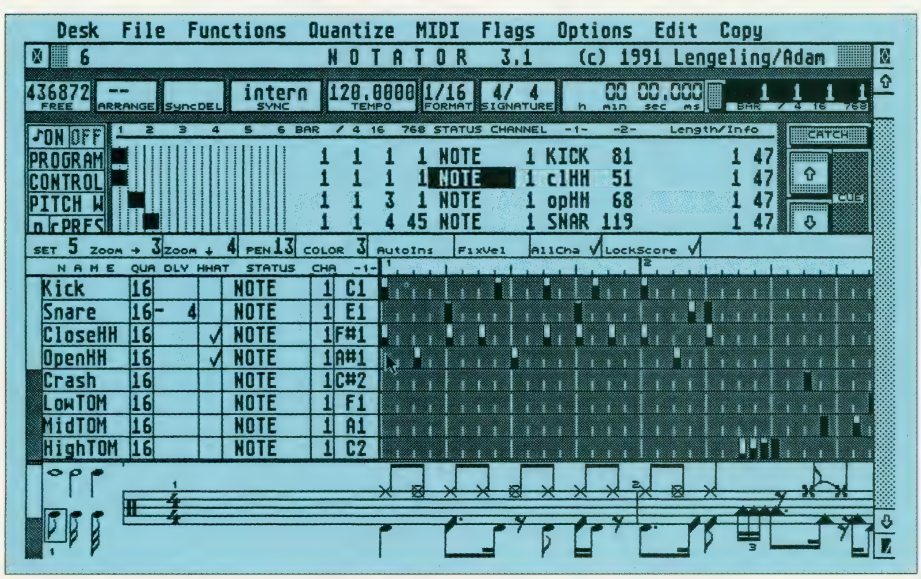

Fig. 4. In Notator's HyperEdit screen, a whole rhythm pattern can be viewed graphically, along with notation for the same part (bottom) and an event list (top). The height of the bars shows the velocities; these can be edited by dragging across them with the mouse. Note that the noteheads on the staff are at different positions from the note values shown in the column in the center of the HyperEdit display. This is accomplished by selecting Set Drum Map in the Options menu.

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"teach" Notator a sys-ex message. When you send it several instances of the message, it not only records the sys-ex data but figures out which byte in the packet is the variable to be assigned to the slider. Almost any parameter on any synthesizer or effects device can be controlled in real-time from Notator using this function.

LISTEN TO MIDI and the PUSER section of the RMG can be used even when you don't need to transmit sys-ex. Why would you do this? To mix data types (mod wheel, pan controller, volume controller, and so on) on a single RMG screen, to set range limits for the sliders, to have a bank of switches, to get twice as many controls on screen at once, or to have faders that always track the data on playback no matter what data type they're transmitting.

HYPEREDIT

The HyperEdit window in the Edit screen allows graphic editing of almost any type of data. There's no need to segregate data types in different tracks just to get a more convenient display. Enter the Edit screen by pressing E or clicking the Edit button, and toggle HyperEdit on or off by pressing J. You can view the HyperEdit, notation, and event list displays at the same time. To lock the notation and HyperEdit displays together, click on LockScore.

To get the events you want to see into the display, click and hold on the border between the list along the left side and the main graphic display, and wait half a second until the hand tool appears. Then drag this border to the right. Now you'll see a list of note names or other values, which can be edited. (To move this border back and forth, type <ALTERNATE> J.) To edit existing data graphically with the mouse without inserting new events, click on AutoIns so that it isn't checked.

If you prefer to draw a controller contour rather than use the RMG, select the controller type in HyperEdit, check AutoIns, and choose a suitable density in the QUA column. (For pitch-bends, a QUA value of 96 is probably best. For volume control, a QUA of 16 or 24 should be plenty.) The QUA setting only affects data you enter using the HyperEdit display, not data recorded in other ways. You can change this parameter freely while you work,

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to control the density of the data you're entering manually. QUA can't quantize data already in the track.

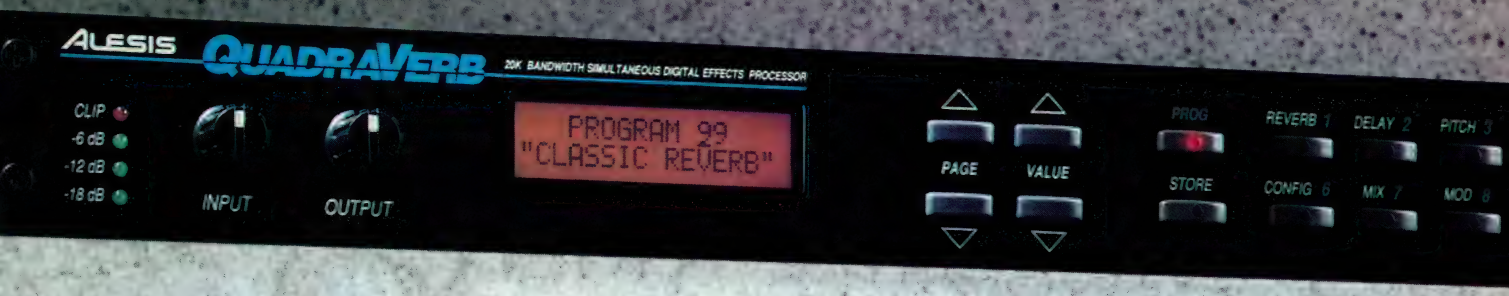
Controller data entered in HyperEdit will fall on the beats defined by QUA. If you're concerned about tight timing on playback, you can shift all of this data ahead or behind the beat a few ticks using the DLY parameter (the third column at the left side in Figure 4) in HyperEdit, or by clicking on the INSMODE button and then editing the time of the first controller event.

The DLY parameter is also helpful when you're using HyperEdit to display drum parts. This parameter shifts individual drums forward or backward in time without affecting the rest of the track. With a drum track that contains several instruments, you can choose a vertical zoom value as low as 4 and drag the top of the HyperEdit display upward in order to display as many as 13 instruments at a time. (Click on the gray area in the scroll bar on the left side of the screen to see the other three instruments.) For graphic controller editing, a vertical zoom of 30 will display the event contour for one "hyperinstrument" (C-Lab's term for a single line of data in HyperEdit) with maximum resolution.

Right-clicking on the name of the event brings up a dialog box in which you can apply quantization (including user grooves) to individual drum sounds. In this box you can also convert the chosen events to another type of data, or convert an entire set of 16 instruments to some other set. This is a quick way to remap a drum track if you want it to be played by a different tone module.

Eight HyperEdit "sets" are available at a time, each one containing up to 16 different types of events (note or controller types). By selecting ALL instead of an individual note or controller number, you can set up a display that shows all of the notes in a track on a single line, for quick graphic editing of their velocities. Again, the HyperEdit sets can be loaded from another song using the Load System command in the Edit menu.

In Part Two of this clinic, which will appear in *Keyboard* in a couple of months, we'll discuss Notator's Transform and Realtime Transform features, and give you some score-printing tricks.



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55. All Alesis reverbs are great
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57. It was the finishing touch on my demo
58. ...and my demo got me a deal
59. It's great to borrow, but better to own
60. Late at night under headphones I leave the planet
61. My mixes sound like movies
62. My speakers sound bigger
63. Close your eyes and you're there
64. For a successful music career
65. For birthdays
66. For Christmas
67. The auto-panner is great
68. Michelangelo would have used one
69. It gives me new keyboard sounds for free
70. It's so musical sounding
71. It's as wet as you can get
72. Use as much as you like
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74. The ring modulators are great for sci-fi
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LETTERS

Continued from page 11

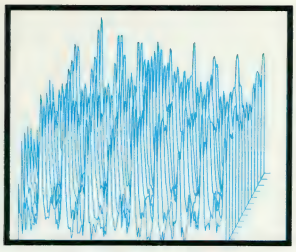
cation of fraud. I 'speculated' that the cup held soda; I sure didn't think it held gasoline. My guessing that it was soda attests to the efficacy of the VA effect, because I immediately associated a smell with a sound. This sensation is called synesthesia. If musicians or other cyber-artist-types had demoed the VA gear, they might have realized this is a good thing for a demo subject to experience.

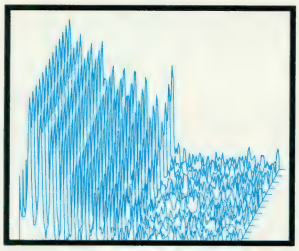
["I told Richard that I chose to write about Virtual Audio for two reasons: (1) The demo proves that this 3-D process works, and (2) the presentation was so 'Hollywood' that it set CyberArts attendees abuzz. 'Scantily clad' referred to the dresses' low-cut style, not length. (In our conversation, Richard told me he picked out those dresses for the 'girls.') The description 'blond' referred to the two women who ushered me into the demo. I wish that Virtual Audio's use of sex to sell was an isolated incident. It's not, neither in mass culture nor in this male-dominated industry. It isn't easy for women in technology to be treated as intellectual equals; it's even more difficult in an environment where other women are dressed like the models in Robert Palmer's 'Simply Irresistible' video.

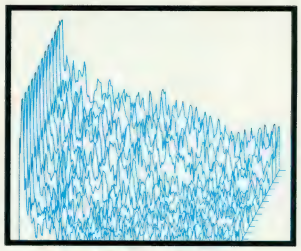
["As a journalist, I try to inform and entertain in my writing. I also aim to point out inequities in social relations in the music industry, an area I've covered since 1980. Had this article been a news story, my approach wouldn't have been appropriate. But it wasn't 'news.' Journalists as a group have a strong sense of responsibility to the public, a conviction that what we do has significant impact on society and should therefore be done responsibly. What is the value of having concerned journalists if we hide our concern when we cover events?"]

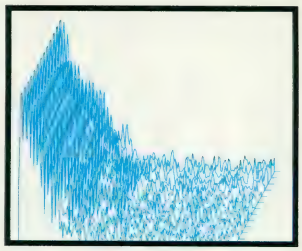
Corrections: Memorymoog Update

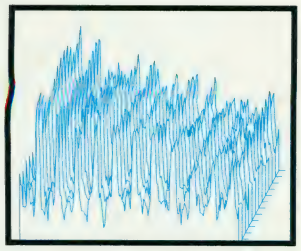
[The phone number listed in our June '92 Letters column for Stage Electronics is incorrect. Also, Jim Suchora, the owner of Stage Electronics, tells us that the Memorymoog upgrade described by John Trevethan is (a) not yet available to the general public, and (b) did not, in fact, include such features as velocity response, despite Trevethan's assertion that it did. Partly because of the strong response prompted by Trevethan's letter, Suchora is developing a more complete Memorymoog upgrade, which he expects to be ready in time for the NAMM show next January — at a price somewhat higher than the $50 noted by Trevethan. Anyone interested in placing an advance order may call Suchora at the correct number, (716) 684-1090, or write him c/o Stage Electronics, 210 West Ave., Depew, NY 14043.]

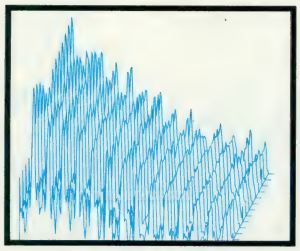

Sync Sweep Wave


SA Rhodes 2 Wave


GTR HARM Wave


Fretless 1 Wave


ST. Strings-L Wave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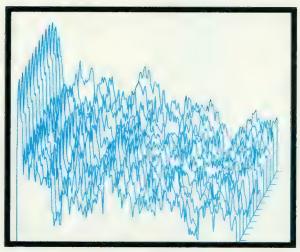
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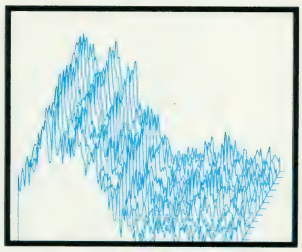
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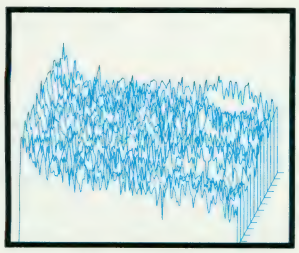
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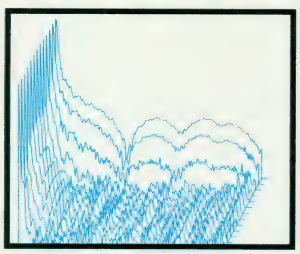
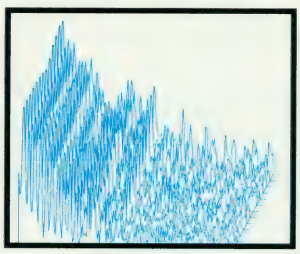
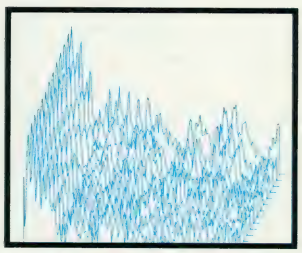
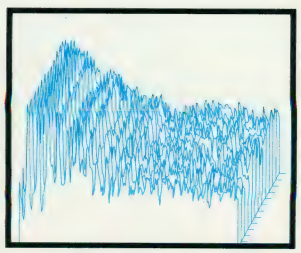

808 Kick Wave


Grand sft 1A Wave


BS Slide Wave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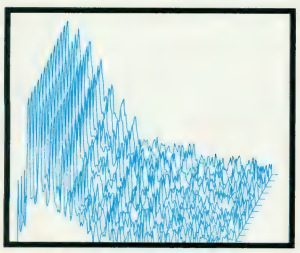
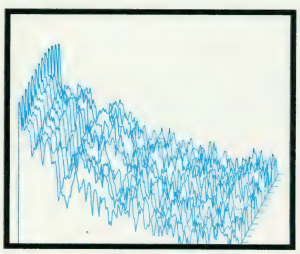
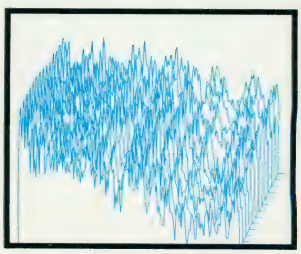

Flugel A Wave


Tenor Breathy Wave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HOW blunt talk, sharp sounds, and the ***NEW YORK VIBE*** made...

jason miles

...TOO FUNKY for jane fonda

by dominic milano

INTRODUCTION BY ROBERT L. DOERSCHUK

PHOTOGRAPHY BY MARGO REYES

On any given day, gangs of musicians swarm up and down Manhattan from one jingle date to the next. But while these session stalwarts chase after taxis, speed-read charts, or call their services for news of the day's next gig, Jason Miles is most likely on a more stationary job, listening when he's supposed to listen, making suggestions when asked to, doing a little tweaking, and ultimately coming up with exactly the sound and part his client needs.

In his determined scramble toward prominence in East Coast

jason miles

studios, Miles hustles as hard as anyone else. But in the studio, he's more artist than hired gun, taking the time he needs to create something new. Word about Miles began spreading through New York back in the mid-'80s, thanks largely to his work on the last three Miles Davis albums. In those days, his rep stemmed from his programming, particularly in the sounds he brought to *Tutu*. Since then, Miles has built a strong resumé as a player too, with credits ranging from the lush balladry of Luther Vandross to the pictorial textures of Phylicia Rashad's and Sigourney Weaver's fairy tale recitations, to lean, mean dance tracks that proved too hot for Jane Fonda to handle.

Miles can savor the first fruits grown from more than a decade's hard work, including a hot solo album, *Jason Miles World Tour*, in the can, complete with backup vocals by Vandross and guest shots by Michael Brecker, Mark Isham, and other all-stars, and a calendar filled with big-time dates. It was largely the discipline born from the grind of this early routine, coupled with the rush of ideas unleashed by his first contact with MIDI, that eventually made it possible for him to set up a schedule based on steady work for a handful of influential friends. Even so, the hustle is far from over.

"We don't make as much money as the guys in L.A.," he says between bites of ravioli on a rare night off at home. "Everybody I know on the East Coast is really on the struggle routine. We go from day to day. A lot of us are driving Nissan Stanzas or Toyota Sentras, and doing jingles to get by. In L.A., it seems like there's more work. There's five million things going on, whether it's TV, movies, records, or whatever. But the other thing is that being out here keeps your creative juices going. I'll get a lot of crap for this, but I don't care: A lot of the music I hear being made in California has that one sound — very slick, very clean. That's because everything in L.A. is nice. The weather is nice, the people are nice. You could be nice all the way to oblivion. The people here are harder. It's a harsher environment, and they have to struggle more. But that means you can get more out of yourself here. I really believe that."

One thing's sure: We had no trouble getting plenty out of Jason Miles. As candid as he is creative, Miles let us kick back, California style, as he led us on a trek through the tangle of his frustrations with the music industry, the secrets of programming a killer string sound, the problems with Japanese synth design, and the differences between getting established and "getting over."

• • • •

You've put together an impressive resumé over these past eight-odd years. When you add to it with, say, a Chaka Khan session, does that push you that much further toward the inner circle of first-call players?

I've got to tell you something. Just because I've worked as a programmer with a lot of people, that doesn't mean that some record producer will call me and say, "Wow, I love your work. I want to work with you. You've got to do for me what you did for Luther or Marcus [Miller, bassist/producer]." It does not work like that. The fact is that every record can make or break your career. Every record is critical. The pressure of what's expected of you if you're a player or a programmer at the A level is very high. I don't know how many people can actually sit in a room for three months and do every synthesizer sound on an entire album. And then I want to see that record sell a few million copies. It's not that easy, because the most demanding people in the business aren't happy with just okay. That's not acceptable. It's got to be incredible.

Give me an example of something you did to make a part sound incredible.

Well, on Luther's last record, I asked Marcus, "What do you think we should put in this one part?" And Marcus said, "Give me a sound that nobody's ever heard before, ever." That's one. There were some good things on *Amandla*. I was in there with Ben Sidran, who was a friend of [producer] Tommy Lipuma. Ben sits down and he says to me, "Man, this stuff is incredible. I've never heard anything like this in my life. The sound is amazing." Tommy and Marcus were there, and they're all going, "Hey, don't say too much, man. We don't want him to go too far out on it." But, you know, you do something good one minute, and the next minute, no matter what you do, you can't get anything right. You were a genius, and now you're a schnook again.

Does that kind of pressure stifle a lot of new artists?

Radio is what's stifling the people. The unfortunate thing is that it comes down to the dollars and cents of advertising on the radio. See, I'll put my solo album up against anybody's instrumental album. But I'm not able to get a deal for it. I sent my tape to a guy at a major record company, and he told me, "Your tape is dynamite. I love it. But it's too funky for the radio stations." So you have to figure out how to get it across, how to make it creative but also make it so these guys aren't going to have to stretch their brains too much to appreciate it. Believe it or not, there are just a few musical people in the industry. Talent is very thin out there. That's why, when you listen to the radio, you hear 500 singers all starting to sound like each other. We can thank the synthesizer industry for that too, because it's so easy for people to buy the sounds, or get a Korg M1 and MIDI a couple of keyboards together. All those synthesizers sound the same after a while.

As great sounds proliferate, you find that you no longer have a select few players or programmers as exclusive sources for sounds.

Right, like Michael Boddicker. Whenever you see his name on something, it's great. Like, when I heard that fast sequence in "Black or White" [from Michael Jackson's *Dangerous*], I went, "Yo, that was slick!" I looked at the credits, and sure enough, they gave him a special credit for "speed sequencing." That's why I thank God I've gotten some calls where people say, "Man, I heard this song on the radio, and I knew it was you. Those were your synthesizers." That comes from hard work and knowing your instruments. It's critical that

JASON MILES: A SELECTED DISCOGRAPHY

With Miles Davis
Amandla, Warner Bros.
Siesta, Warner Bros.
Tutu, Warner Bros.

With Luther Vandross
Any Love , Epic.
Give Me the Reason, Epic.
Power of Love, Epic.

With Other Artists
Ashes to Ashes (w. Joe Sample), Warner Bros.
A Change of Heart (w. David Sanborn), Warner Bros.
Baby's Nursery Rhymes (w. Phylicia Rashad), Lightyear (350 Fifth Ave., Ste. 5101, New York, NY 10118).
Close-Up (w. David Sanborn), Reprise.
Collaboration (w. George Benson & Earl Klugh), Warner Bros.
Introducing Jonathan Butler, Jive (c/o Zomba Records, 137-39 W. 25th St., New York, NY 10001).
Oasis (w. Roberta Flack), Atlantic.
Provision (w. Scritti Politti), Warner Bros.
The Snow Queen (w. Sigourney Weaver), Lightyear.

everybody take a little time out to make a few original sounds. What's the first thing that people say when they put on a new record? "Sounds good." But, at the same time, a good sound doesn't mean that it's a good part. And if you've got a good part and a lousy sound, people will go, "This sounds like crap." A good sound *and* a good part is a good part. You know, on Luther's last album [*Power of Love*], Marcus's big joke was, "These synth guys, they want 40 sounds on every part." Well, I think that the most important thing is to have the *right* sound. It could be one synthesizer. For some really great string sounds, you might need seven synthesizers, depending on how much of the track you need to take up. It's a very delicate operation.

What's your recipe for a great string sound?

For a pad sound, depending on how thick it is, first you take some of the special brews I've got for my [E-mu] Emulator Three from Scott Hybl at Northstar; he's got some string stuff on his Phase 2 disk that is just fantastic. Then I would go to my [Sequential] Prophet-VS and get some analog shadowing for some warmth. Then I'd put some digital D-50 strings in to twinkle somewhere above the analog and below the EIII. Then I go to a special string sound in my [Korg] Wavestation, called "JM Warm Strings" — I put a money sign next to it because that's where I go when there's money at stake. Then I'll go through my other instruments. There might be something from the Emulator II with a little more bow. There was one string sound I did on "Sometimes It's Only Love" [from *Power of Love*] that was the hardest one I ever did. There were, like, nine synthesizers on it. I put trills in there too.

Were the trills pre-sampled?

Yeah. Luther was, like, "Jason, I've already sent the orchestra home on this one. Please make it so I don't have to get them all back just to do trills."

So it's not unusual to get called specifically to play orchestral parts in lieu of actual orchestral musicians.

Well, I can tell you about this one orchestra date I had. Afterwards, the conductor came up to me and said, "Jason, can you come over here and double all the string stuff for us? We like the way your strings sound." "Better than the orchestra?" "Well, I'm not going to say that, but it's going to help a lot." Or, like, I was doing this American Express thing, and this major trumpet player walks up and goes, "Jason Miles. Yeah, you're one of the motherfuckers who are keeping us out of work." This dude was serious. But you know what? When somebody says, "We're thinking about putting brass on this thing. Can you come up with some brass stuff for us?," I say to myself, "Man, I'm going to kill this stuff and make sure that *I'm* the one on here." Not that they're always planning to hire brass players, but on a couple of projects, it worked out that way. I'm not taking anything away from brass players. It's just that if I'm in there to do what I'm supposed to do, then I want to do the best that I can.

Technology is the culprit. It gives people the chance to make records without knowing anything at all about music.

It's a competitive world.

Sure, we know that, but the whole thing in America is that people think it's their birthright to get the gig. Let's face it, the Japanese synthesizers are really the more reliable ones. They're kicking our asses all over the place, especially Roland. Roland's a great company. They build good stuff; it's reliable, and it works. I'll say this, though: The Japanese companies are more impersonal toward you than the American companies. I mean, with all this voice mail crap, I don't even know if I know anybody at Roland. Companies like Roland and Yamaha don't give you a chance to get personal, whereas there's always been a real personal vibe at E-mu, like there used to be at Oberheim and Sequential. More personality has got to come back into these companies if people are going to get juiced about buying gear again. Right now, they're just throwing their stuff out there and going, "Buy it! Buy it!" But you know that if Roland has a new synth coming out, it's going to have a cold personality. I do believe that the JD-800 was something special, but the MicroComposer wasn't very musical to me. But look at the [Akai] MPC-60: Roger Linn built it, and *that* thing is personal.

Still, you believe that American manufacturers are not competing effectively with the Japanese in this industry.

Right. America is in the dumper now, and it's, "Hey, everybody all over the world, feel sorry for us." And they're saying, "Screw you. You've been acting like elitists all these years. Now you're in the shithole and we're supposed to treat you nice?" Record companies are the same way: "Oh, we're struggling. We're having a hard time." Then they have a big hit: "Oh, we're the best. We only sign true talent." Yeah, right. A band is together for five jobs, and they get $800,000.

And that bothers you?

No, man. I get in these coversations with friends: "Do you believe they pay that guy two million bucks to play baseball?" Hey, let me tell you something. In baseball or in music, it's not about how good you are. It's about getting over. If you've got a plan to get over, it doesn't matter whether you're a good musician. I don't want to hear that this guy stinks or that he can't play — *he got over.* There are guys living in million-dollar houses in Malibu because they had two albums and got over. If you want to just be around for a minute and try to get a million dollars, you just may get lucky. But this doesn't bother me, because I know I'm a good musician. If I go in and I see Marcus playing all the keyboards on something, that's fine because I'm secure. I know who I am. I can tell you that I've been successful, even though the moon and the planets have got to be aligned just right for you to get that deal. It doesn't bother me when Marcus is running the show, and the music is coming out incredible. What *does* bother me is when the people I'm working for don't know what they're doing. I've worked on dates where they're paying me really good money, and one guy says, "I want to know how many parts to put on the chorus, so go out there and sing the chorus." And the other guy goes, "No, man, I told *you* to write the chorus." "I didn't write the chorus. I thought *you* were going to do it." At that point, I'm going, "Man, oh, man. Time to hit the wide-screen TV." Because these guys are

jason miles

paying me to make them sound good, and they don't know what they're doing. The problem is that you can't tell the difference between some of these bands anymore.

Why is that more of a problem these days than before?

Technology is the culprit, because it gives people who have no musical experience at all the chance to make records without knowing anything about music. All you really need is a little vision. I remember working on this Miles Davis thing, "Hannibal" [from *Amandla*], one of the most complex tunes you ever want to hear in your life. Marcus wrote the middle part to it, which was a complete orchestration around Miles' line. I said, "Man, what's the story? This is amazing." And he goes, "Well, I had the melody in my head. I had this vision that it should be like a small big band, and I knew how it had to sound." Unfortunately, not everybody has that gift. So, in a way, this technology is like heaven and hell. To me, it's like heaven, because I can make anything happen with my stuff. When I go into these records, I try to have it so that you don't have to go any further than here. If you want drum programming, I've got a ton of drum sounds. You want trashy stuff, I've got trashy stuff. And Luther's last record? Forget it, man. I had my Wavestation reprogrammed with a ton of new stuff because I knew that he wasn't keeping me for three months because he wanted to hear the same old stuff. They wanted something fresh. You have to have a vision in front, and not go back to what you did before. What you've done is done.

You don't use factory sounds at all?

We all use stuff from the factory at some point, because there are some nice factory sounds. But everybody totally uses those sounds until you can't use them anymore. I used [Roland D-50 preset] DigitalNativeDance on a tune for Miles. I tried to use something else, because I told him, "Man, by the time this record comes out in a year, this sound is going to be on 400,000 records." He didn't care. He liked it. But a great portion of my synthesizer stuff is original, because the architecture that we're given to work with in these instruments is fantastic. I can't even tell you that I've gotten totally into any of the instruments that I've had, because there's just so much stuff there. I don't care about mod-

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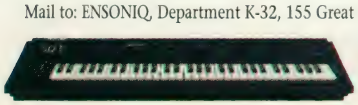

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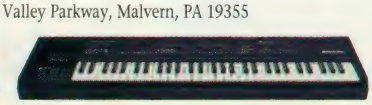

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ulating the release of this sound, and then it's going to cross-modulate into the filter. There's just not enough time to experiment with it all. That's why I'm into the JD-800, because you can experiment quickly and take care of a lot of things. And us old analog dinosaurs like the knobs and faders. So I'm pleading with Yamaha to make their stuff a little more difficult to program than it is now. Then, in two years, that company definitely won't be around [*laughs*].

You really like working on the SY77, don't you?

Oh, yeah. What a dream. Like, I can do every operator. Well, I don't give a shit; just let me get into it quickly and use my imagination. I don't want to find out that something's wrong because I missed four other moves I had to do on two other pages. They'd better realize that their synthesizer isn't the only one I own, and I don't have the whole day to spend working on it.

Do artists come to you and ask for sounds they heard you do on previous projects?

Sure they do. I've lost work because of that. I tell them, "Look, I know Luther well, and unless you want to see Judge Wapner come after me, I can't give you that bass sound that was on 'Stop to Love' [from *Give Me the Reason*]." That was my most requested sound, but I have an obligation to the people who hire me. Besides, after Luther's last record, I honestly felt that I had taken my rig as far as I could. That's why I called my friend, Richard Bruyn at EPR Electronics [see Tech Tales, Sept. '91]; we sat down and designed a new system.

Describe the process of putting a new system together.

Well, first, I got an E-mu Proteus. I don't know whether I need it, but a lot of people I know have got Proteuses that they use to start off a part, so this gives me a starting point too. I've got an E-mu Procussion [drum module], which I love. I have a rack-mounted Wavestation A/D. I've got two Roland mixers. I've got an Ensoniq EPS-16 Plus with a Frontera CD-ROM 44Mb removable. I've got the Midimoog from Studio Electronics. I have a Voce [DMI-64 organ module], which I'm about to

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dump. A bigger piece of crap I've never seen in my life. Sure, it sounds like an organ, but you can't hear it because the output is too low. I've got a Joey De Francesco Hammond organ sample on my EPS-16 Plus, and I'll do more with it than I could do with the Voce. Then I have my other synth rack, with a Waldorf Microwave; it's not quite a PPG, but it's good enough that I'd lug it around with me. Its MIDI implementation is great, and it's also a great analog synth. I've got a Yamaha TX rack with four modules in it. I have the Roland Super Jupiter and D-550, both with programmers. I have a Roland MKS-20 piano module. I have an audio rack, which also has my programmers in it. It's got a Beetle programmer [for the TX rack], which is faster to use than a computer, and my Super Jupiter programmer, and my custom Quest 32-channel mixer. I have a 16 x 32 Sycologic MIDI patch system. Then I have my synth station, with an Oberheim Matrix-12. I have an E-mu Emulator Three, and an Emulator II below that. I also use the Ensoniq SD-1; below that I have the hard drive rack with an Optical Media CD-ROM, E-mu's removable 44Mb hard drive, and a 300Mb hard drive below that. The last thing is my sequencing station, where I also have my Roland JD-800 and the Akai MPC-60.

No computer?

I have a Mac Classic, which is fine when I'm working alone. But if I'm in the studio with people, it gets in the way. We had a lot of Mac crashes on Luther's last record. One of the arrangers and composers, my good friend Skip Anderson, brought in this song on the Mac, and it crashed all day long until he finally said, "Jason, can you help me get an MPC-60?" Now, the MPC-60 isn't perfect; its resolution isn't as high as the computer's. But for just getting it done on time, it's fine.

Have you felt pressure to get an NED Synclavier or other high-end gear?

I don't think a Synclavier can help my career in any way. There are fantastic things in the Synclavier, but since my main thing is being involved with records, I just don't think it's necessary. Maybe it is in Hollywood, because L.A. is so flash. It's a whole other thing — tinseltown, right? Status above everything.

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jason miles

It's about who's got more RAM. I mean, certain film studios need it for their post-production work, but I hear about it crashing all the time. Who needs that kind of pressure? Every part you replace is $1,000. I don't have that kind of money.

You don't seem very enthusiastic about what's happening on the West Coast.

Well, I'm not telling you that the quality of music they do in L.A. is bad. But, I mean, Luther was at a top L.A. studio, and when I looked around in there, everybody he hired was from New York. He still likes that kind of energy. And one of the top producers, Tommy Lipuma, who has lived in L.A. for years, is back in New York. You can really get more out of yourself here. Even when I'm in L.A., I find myself drifting. It's like, "Damn, the weather is so nice. What can I do this morning to not work?" That's the way it is. The sounds that guys get on synthesizers are different too. There's more of an R&B thing in New York. It's like the thing I did for Jane Fonda's *Lean Routine* video. These exercise folks are not funky. Jane sent me this tape of all the rap stuff that her son likes, so I sent her back all these beats, and when her assistant heard them, he said, "Oh, it's too funky." Well, it's hard to be funky when you're a white chick with a $7 million home in the Santa Monica hills. A guy like Luther, even though he's very wealthy, worked his way up from the housing projects.

Sounds like you've got your share of frustrations in this business.

Yeah, but you know what? I love it. It's not easy. Like, when we did *Power of Love*, I was so burnt. Every day living in a hotel in L.A., and getting back around 1:30 in the morning, then getting up at 9 or 9:30, doing a workout, eating breakfast, and going right back to the studio, six days a week. You can't complain, although I did put my foot down when the Knicks were in town. The thing is that doing this for a living is being blessed. I don't care if you're in a wedding band, if you're doing jingles, if you're doing industrial films, if you're playing oboe for the *Ladies' Home Journal*. If you can hang in there instead of getting up at 8 to go to an office every morning, it's a blessing. ■

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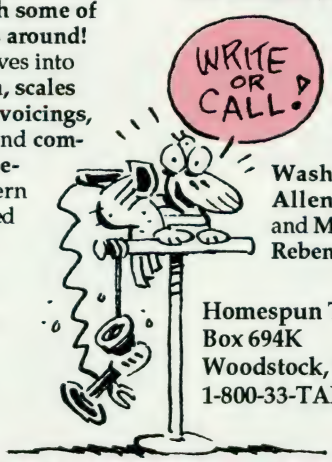

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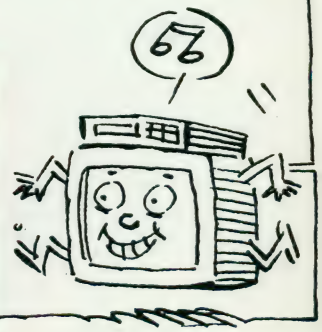

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WENDY CARLOS

FURTHER ADVENTURES IN THE MAKING OF SWITCHED-ON BACH 2000

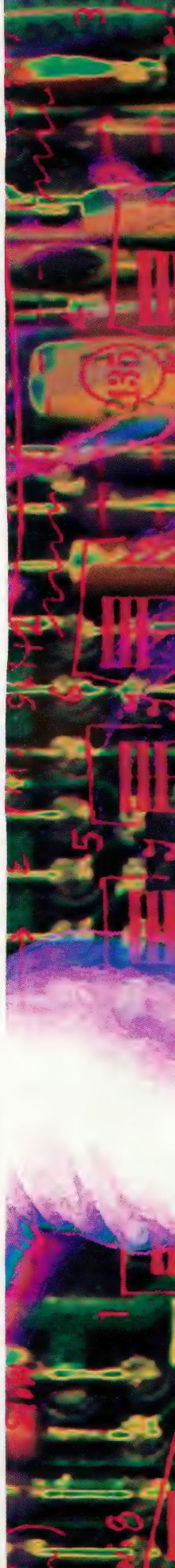


ILLUSTRATION: RICHARD LEEDS SOURCE PHOTOGRAPHY: DAVID ROSE

Music has always been intimately connected with technology. Think about Stradivarius stirring his pots of lacquer and glue, or the breakthrough of the valved trumpet, or the hundred years of experimentation that went into the delicately shaped moving parts of a piano's action. At every stage, far-sighted musicians have been pushing the envelope, telling instrument builders what worked and what didn't, cultivating new visions of what was possible.

When it comes to electronic technology, with its unprecedented levels of complexity, fewer musicians have the dedication or the patience to stay out in front of the curve. If we want to know what our musical tools are really capable of, we have to look to artists like Wendy Carlos. As she celebrates the 25th anniversary of her landmark recording *Switched-On Bach*, Carlos is still pushing and pulling at her synthesizers, coaxing

INTERVIEW: DOMINIC MILANO

INTRODUCTION: JIM AIKIN

WENDY CARLOS

them to soar to new heights of expression.

The original *Switched-On Bach* was recorded entirely with a modular analog synthesizer. She played one line at a time direct to multitrack tape — no sequencers, thank you, and no computer memory to store patches in. The recording process took the better part of a year. With today's more powerful tools at her disposal, you'd think Carlos could dash off the just-released re-recording of the same repertoire, *Switched-On Bach 2000*, in a couple of months. But no. She spent *more* time on it than on the original. When you really understand what the technology is (or ought to be) capable of, and when you aren't willing to compromise your artistic vision, that's just the way it goes.

In last month's cover story interview, Carlos revealed some of the processes she used to create the new recording. She talked about Bach interpretation, the use of Baroque tunings on synthesizers, and the perils of pro-

INSIDE THE NOTES

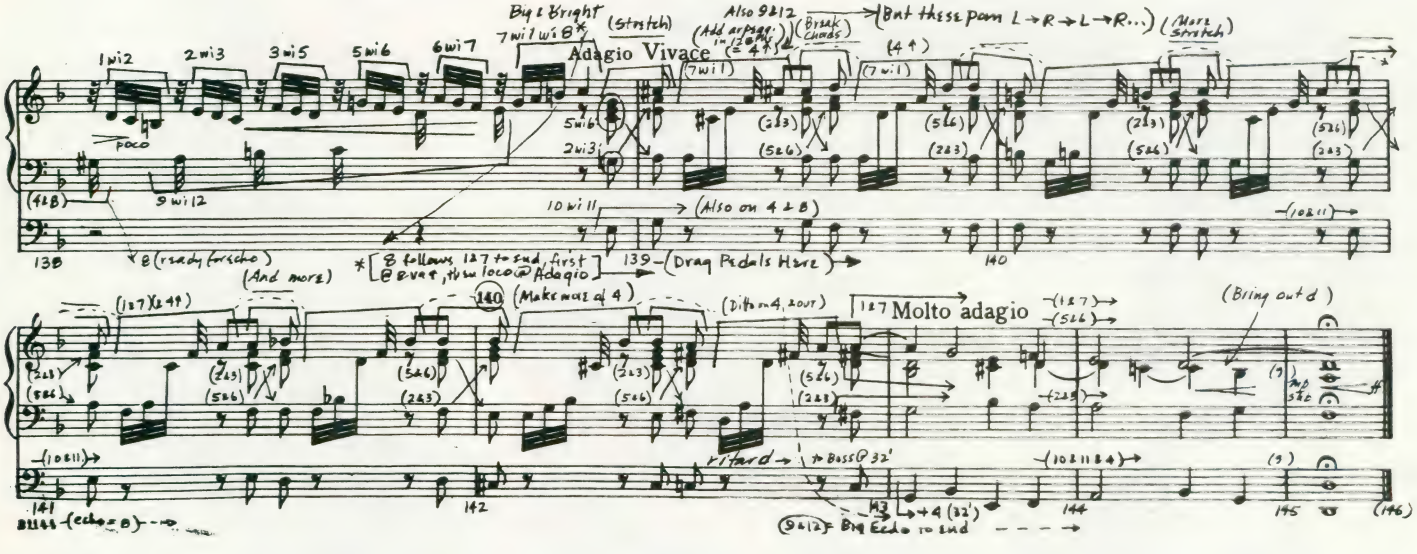
In her Bach realizations for Switched-On Bach 2000, *Wendy Carlos did much more than simply play the original music using synthesizers. She actually gets inside the musical lines, orchestrating them both timbrally and spatially.*

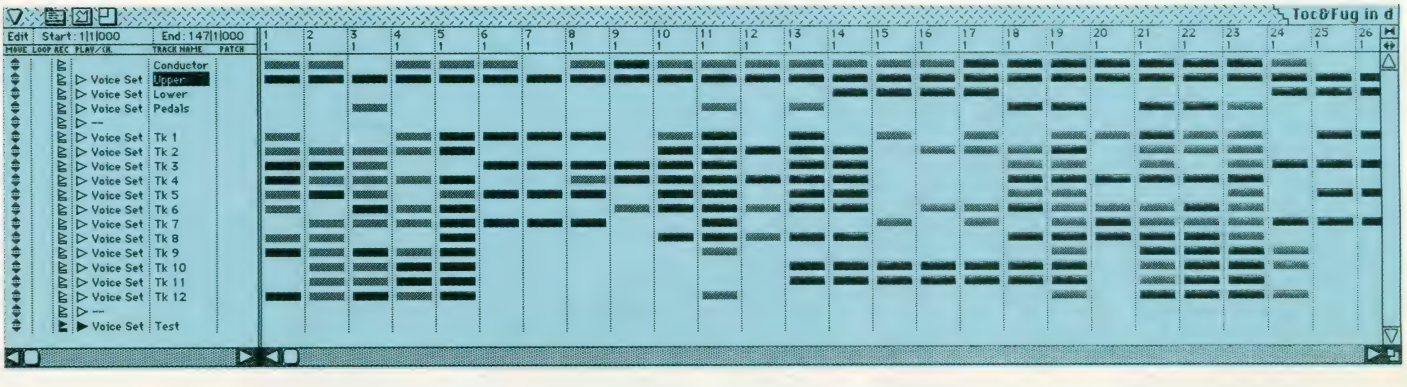
Below are the final bars of Bach's Toccata and Fugue in D Minor *for organ, shown with Carlos's notes and additional markings. Carlos used this as a roadmap for her realization, which was created with Mark Of The Unicorn Performer as her sequencer.*

Underneath the music is the beginning of Carlos's sequence for the Toccata and Fugue, *shown in Performer's Tracks window.*

To the right are tracks 4, 5, 7, and 8 of Carlos's Performer sequence for those same bars (138-145), showing her use of hocketing. The track displays are in "piano roll" format: Pitch is shown from top (high) to bottom (low), while time is from left to right. Each note is shown as a horizontal line, and the duration of each note is indicated by the length of the line. Bar numbers are shown in the ruler at the top of each track display. Notice in particular how the notes of bars 139-142 are spread over various tracks, creating timbral and spatial movement within the texture of Bach's original.

For more on Carlos's realization of the Toccata and Fugue in D Minor *and her use of hocketing techniques,* *see pp. 87-90.*





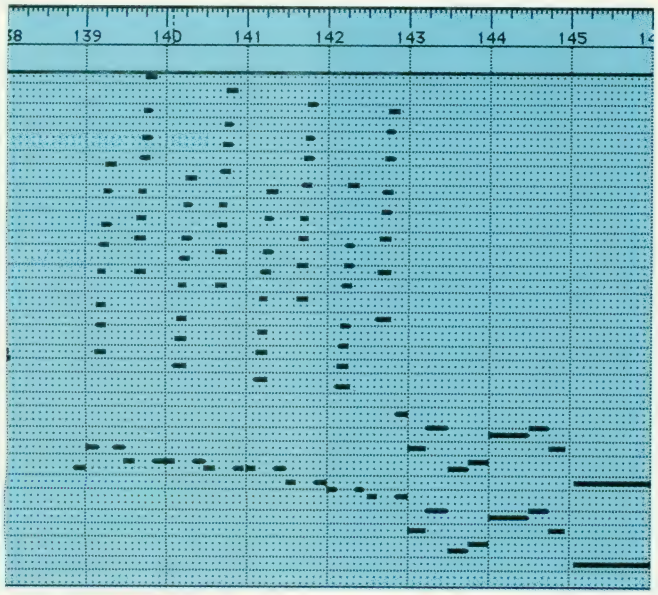
gramming original sounds. A lot of other fascinating material had to be omitted, however, due to lack of space. But we just couldn't bear not to share it with our readers — so here it is. In the second half of the interview, Carlos explains how she broadens her horizons by interacting with new tools, muses about the pros and cons of composing directly onto the computer screen with notation software, and champions the cause of creativity. She dissects her recording of the *Toccata and Fugue in D Minor*, reveals the perils of working with digital audio devices, and tells how she uses sequencer editing functions to make her music more evocative.

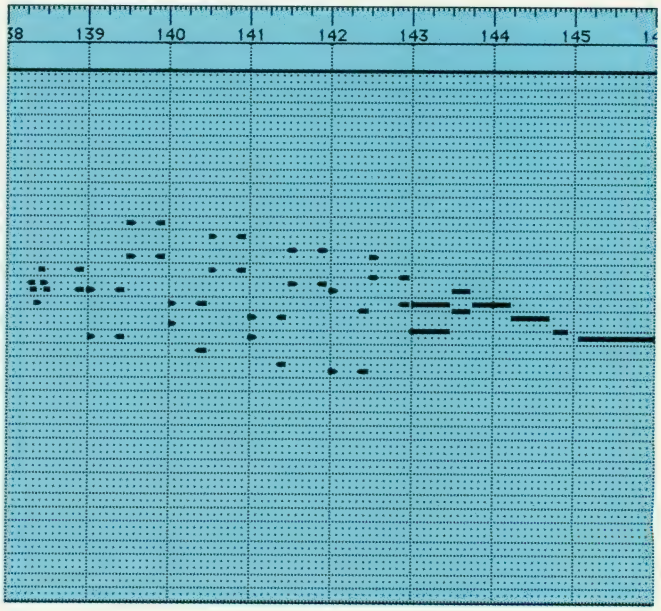
More than anything else, both in her work and in her words, Wendy Carlos challenges us to broaden, and deepen, our vision of what music can be as we plummet toward the new millenium.

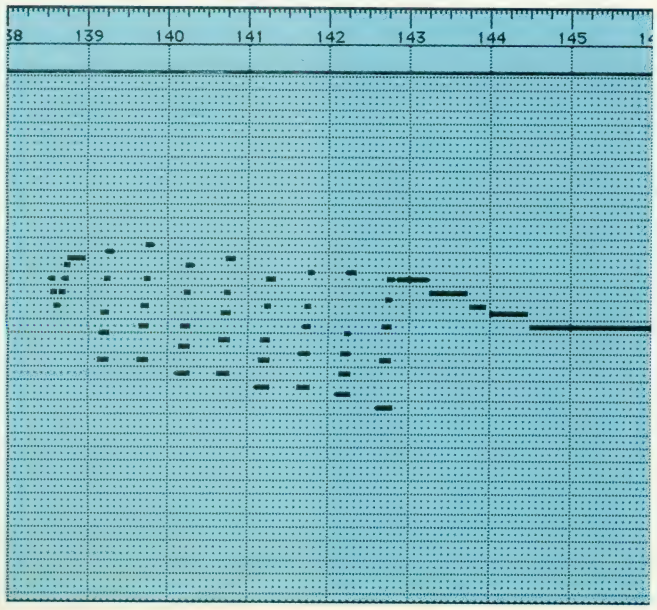
• • •

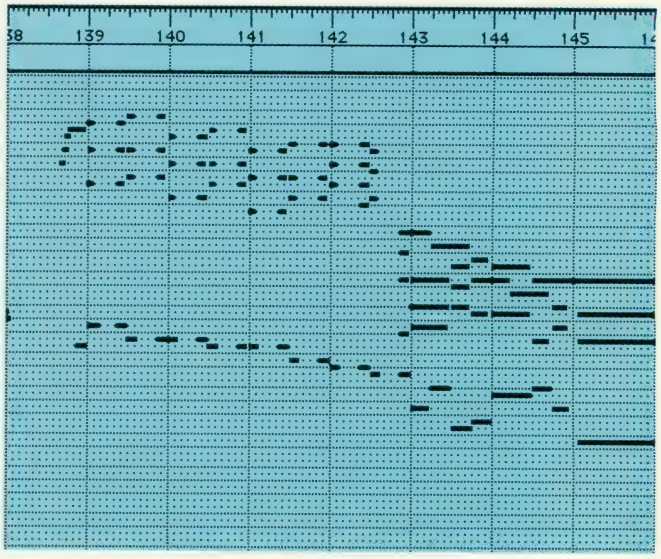
Unlike many of today's synthesists, you bring both a scientific understanding of the technology and a command of traditional orchestral music to your work. Is this combination of attributes what distinguishes your work from that of your contemporaries?

Perhaps it's the exposure that counts. Look at the young people who have never been to an orchestra concert. I'm not saying that I want to turn all of your readers into lovers of Brahms, but they should at least hear a few of the masterpieces of Western music — Eastern too, for that matter. They should take advantage of the opportunities that CDs give us to hear what, say, a gamelan orchestra sounds like. Give yourself the experiences, and then, having tasted all the flavors in the restaurant, pick what you want to eat for a particular meal. Why not take advantage of the exposure that current technology makes easy? I consciously lecture myself: "Come on, Wendy! You already know how to use that machine, so give it a rest. You can always go back to it. Let's see what this









other approach can do."

Why waste time retraining yourself when you've already learned to navigate another technology? Because it's *important* to do it. It keeps us from getting mentally flaccid. That's the good side of these interesting times we live in: You can climb into new viewpoints, a parallax — another angle on a similar topic — in your music. Let's shake up the bottle and see if we can get the marbles to fall in a different arrangement. Maybe we'll even play Maxwell's demon and have them all line up into a perfect sphere. In the old days, you'd have to do that internally. Now, you just have to be willing to bite off the next gadget that comes along, and it does it for you. It doesn't matter whether you compose or perform, or if you're looking for something to satisfy a client: The spark that makes you *you*, for better or worse, will still be there. We'd have a healthier music industry if more of this were occurring.

So what, by way of contrast, is *happening?*

Well, don't you think there's an incestuous copying in narrower and narrower concentric circles? There's something very dull about this aesthetic and how it comes out of the way musical tools are being used. It's why *Keyboard* has also become fairly dull for me and some of my industry friends. It's not your fault. As you broaden the base, of course you have to speak to the broadest possible audience. As you reflect that aesthetic, you will also become duller. The alternative is to risk being irrelevant to the main thrust of what's going on by talking about things that most people don't care about or want to know or simply hadn't thought about. I hope it's the latter; if people don't know that there are alternatives, then teach them and go on from there. If it's the former, then there's some prejudice against creativity, in which case we've got an uphill battle.

With that in mind, what are your thoughts on drum machines?

I can't be objective about that one. They're the most destructive things ever to come into the industry. Worse than keyboards. Vladimir Ussachevsky always used to say that if you gave synthesists a keyboard, they'd turn synthesizers into fancy electronic organs. Every lounge pianist would become a synthesist. Which, of course, is what happened to some extent, although obviously there are a lot of good people doing keyboard synthesis too. But when we all found ourselves stylistically pressured to start using drum kit sounds, based on the arbitrary collection of percussion instruments that developed in popular music between the '20s and the '40s, that became a tremendous limitation. Other styles, a Spanish music group, for example, would never be happy with that small selection of sounds. So the drum boxes now include cabasa and conga. But the cliché of bass drum, snare, and hi-hat remains. C'mon, there are so many great percussion sounds that could make a great rhythmic background. Why does so much of today's music use just these three sounds?

And look what the idea of quantizing drum machine parts has done to music. I wish quantization had been added only recently, *after* people had learned the discipline of knowing how to use it to tighten up here or there on human-played drum tracks. Quantizing 100 percent of a rhythm pattern is what gives a lot of pop music and rap the kiss of death for me and a lot of other musicians. It has no human element, and it sounds like a piledriver: *bunk*-a-chunk-a-*bunk*-a-chunk-a. My dad's textile factory in Pawtucket had very loud equipment whose reciprocating motion had a lot of that same "charm." You don't need to be that rigid for dance music. In fact, good dance music never had quite that fascist beat: "You vill now dance on *my* beat. Und you vill *enjoy* it."

When I was still working as an engineer, I met a fellow named Jerry Samuels, who was an engineer in the same place. He had several hits, including a record that was one of the gimmicky hits of the '60s, called "They're Coming to Take Me Away, Ha-Ha." I was in the studio as he was putting it together. He made the drummer play one measure, very carefully, then he made a tape loop so it would stay absolutely metronomic. He deliberately tried to make it as fascist a statement as he could, as a joke. But that joke is standard practice these days.

That's true in sequenced riffs as well as in drum parts.

You're right. But, you know, sometimes I think you enjoy encouraging me to be the *Keyboard* Gore Vidal, announcing that the Emperor is naked, when you knew it all along. Anyway, thinking back 25 years to when a sequencer was something like a Moog 962 or 961, I used it a grand total of four times in 10 years for little bursts of color. Otherwise, it was without any real value to me, although Bob [Moog] had a way to voltage-control the duration of each stage to make it less rigidly mechanical. We've had progress since then, but not all of the change we've seen has been improvement.

How does the state of development in electronic music compare to the state of development in orchestral music?

The orchestra is a mature technology. Very little has been added to it in recent years. Granted, Ligeti, Penderecki, and other good people have found imaginative ways to use instruments — probably not as musically as the standard ways of making sounds, but for spice purposes, quite lovely. Many of the great film composers, from Jerry Goldsmith to Bruce Broughton, frequently invent sounds like these as part of their dramatic and enhancing repertoire. Still, there aren't that many new ways for the orchestra to go, although electronics may take its place as the next division of the orchestra. That certainly seems to be a long way in the future, as long as most traditional composers remain aghast at the idea of accepting anything electronic. Still, the fact is that we in electronic music have probably become the main cutting edge of music, while those who protect the legacy of concert music are its historians. Purely acoustic music no longer seems to be where the arrow of time is aiming. The next breakthroughs in music will most likely be here, in electronics.

Yet some people argue that technological developments have come so thick and fast in electronic music that today's instruments can do more than many musicians — including those who might otherwise lead the way toward true musical breakthroughs — can imagine.

If that's true, then we're cursed, because we will never see that truly mature technology. It's funny, though. We've now started implementing hard-disk recording and editing systems, which have, thanks to Jim Cooper, neat little scrub wheels that can be used to imitate — what? . . . a *tape* recorder? And why not? But it will be amusing if, in a hundred years, people *still* have scrubwheels, whereas if digital audio workstations had come into their own without any previous tape recording, probably we wouldn't use that approach. There would be a way of locating points of sound, like fixed loop playback, but it wouldn't be *this* way. Still, I'll bet you that digital workstations will continue to have scrubwheels 50 years from now, and they'll also use many of the same metaphors that today's hard-disk recording systems adopted from earlier technologies. Ideas that good companies like Sonic Solutions developed will appear again. Even though they don't have any inherently logical reason for being there, people got used to some such approach, and it began to seem natural. That's why the Mac's interface survives so well.

That Macintosh idea of cut-and-paste has spread over into hard-disk recording.

Yup. Yet something about that single clipboard looks a little undeveloped to me. It would be nice to standardize a multiclip design, where you can pop things in and pull them out in whatever order you want — first in first out, last in first out, whatever. Still, cut-copy-paste will be around a long time.

The buffer concept will change as hard-

ware evolves . . .

. . . and as memory gets even cheaper . . .

. . . and as it becomes even more economical to pour dozens of different clips all over the place.

Yeah. Editing written word documents remains a clumsy thing for me. I would have preferred to be able to hold things in place, the way you would on a desk.

That gets into the concept of the way people work with sequencers.

It's very parallel. I don't like some of the things we're forced to do now. It's based too much on word processing, and that's often the wrong approach for music. In the old days, you would have papers scattered around your desk or at the piano, and you'd say, "These two things are going to run consecutively. This thing I don't know where I'm going to use. Here's something I probably can't fit into this piece. Here's something that might work as a bit of glue to tie these two other ideas together." It's two-dimensional thinking, which is implemented very poorly now. The kind of linear thinking we deal with in sequencing almost forces you to work the way that RAM or hard disks work — one long track. That's not the way minds are organized.

Which sequencers do you prefer?

Performer [from Mark of the Unicorn] was the first sequencer I used a lot, so naturally I like it the most. From a purely aesthetic viewpoint, I don't quite like the look of [Opcode] Vision, although I certainly admire what they've done with Studio Vision. I've also heard many good words for [Passport's] Master Tracks Pro. But since we're all reluctant to learn yet another interface, I'm hoping that a stable Digital Performer comes along soon. Also, we're going to be seeing a rewrite on [Coda] Finale this year. That's quite exciting, although the version that exists now is fairly good. I had finished working on a string quartet with Finale just prior to starting *S.O.B. 2000*. Rather than working with pencil and score paper, I typed the entire piece while composing into Finale. It was one of those wonderful learning experience that shakes up all the little gray cells, as [Agatha Christie's detective Hercule] Poirot says, and forces you to reconsider what the process of composing is about. You could just keep using a pencil to write out your score, and use Finale only as a tool for transcription, orchestration, and arranging, but in fact it can be a very powerful *composing* tool. Most music has redundancies of pattern and rhythm, even absolute recapitulations. For any of those tasks, using Finale is much faster than using a pencil. When you want to pop something into another key or take the same theme but change only a few pitches or durations, you can just skim along with Finale. That makes up for the fact that it's somewhat slower than a pencil in the initial inputting stages.

Your initial attempts to type the music into Finale must have been frustrating, as you could think the information much more quickly than you could input it.

You're right. If you want to put a note on the second beat, not the first beat, what do you do? Initially, you may feel paralyzed by thinking of the whole list of functions and tools that exist in the program as the musical steps you might need, but you're not quite sure which is the quickest one. After a while, you begin to find the practical ways, so it's not much different from sketching out a tune.

Do you use Finale to play back sequences?

I constantly use its playback auditioning tool to be sure I haven't missed a note or there isn't some hiccup in the rhythm or harmony. In composing the string quartet, it was a real hoot and holler to be able to audition without looking at the notes. Normally, as a composer, you write something down, then you sight-read it back at the piano or in your head. You're looking at the music as you're doing that, and that can make your eyes think that it's all right when it really isn't. With Finale, you turn away from the screen, play the last three measures back, and just listen. It's amazing how different that point of view is, and it's wonderful to have two independent ways of editing: ear and eye. In many ways, that's why the string quartet is one of the better pieces I've done in a long time. I could be really honest: "That *looked* clever, but it *sounds* unconvincing." It was worth the pain to force myself to give up what was fast and comfortable and workable for something that appeared to be slow, uncomfortable, and initially crippling, but with practice gave me the ability to really write what I had in mind.

WHEN WE DID THE FIRST *S.O.B.*, IT WAS WITH AN ALMOST PRIVATE TECHNOLOGY. TODAY, ANYONE CAN COLLECT THE SAME SORT OF INSTRUMENTS THAT I USED ON *BACH 2000*.

What sounds did you use in playing back the Quartet*?*

I used some simple string sounds from my GDS/Synergies to play back the strings, with one of the Kurzweil pizzicatos. I have a couple of *col legno* and *sul pointicello* things in the Mulogix Slave 32s, so I could do all of the string-quartet-type sounds. Also, I learned how to insert tempo and velocity changes — things that would give the piece a quasi-performance quality.

What role did Finale play in S.O.B. 2000*?*

Both of the pieces I wrote were done with Finale. I had beautiful scores to play from for the "Happy 25th" piece and for the second movement of the *Brandenburg Concerto No. 3*.

What led you to write "Happy 25th, S.O.B.," which opens the album?

I just wanted to do a little tongue-in-cheek anniversary piece to kick off the proceedings. It was just a very Bachian thing that, as I said in my liner notes, drifted into my mind as I was trying to fall asleep one night. I mixed this brief intro about two or three decibels lower than the *Sinfonia in D Major*, which follows it.

The most dramatic departure from the original S.O.B. *is the final cut on the new album, the* Toccata and Fugue in D Minor*, which of course didn't appear on the first record.*

I suppose this was the timbral *tour de force* attempt of the new album, in that I used a little bit of everything on it. There are places where you hear things that sound like real woodwinds, real percussion, real piano, real mallet instruments, and real violin. There are lots of quotes from pipe organ sounds, which you would want in a piece like this, and some slightly Stokowski-like things reminiscent of *Fantasia*. It's a chop suey kind of stew, but what can I say? I like it. And I like the way it dances around the room, which works very well with the Dolby Surround decoder, especially with

WENDY CARLOS

Pro Logic.

How did you put this one together?

It was performed into the Mac as three tracks; it's an organ piece, so I laid it out on upper staff, lower staff, and pedals, and played it that way. Then I bounce-copied over individual notes and phrases to match my surround-spatial annotations. Where there's a fade-in and fade-out, for example, I could scale the velocities so they neatly came up from nothing and went down to nothing. The crossfades were built into the sequence. Obviously, if a sequence is downloaded to individual tape tracks at separate times, it's not the same thing as being an identical sound in phase on two tracks, because the synthesizer is not going to produce quite the same phase/frequency alignments. But I like that, because it gives you all these texturally rich ways of ghosting, even on ostensibly single-line panning elements.

So the written score with your additional markings was a crucial reference.

Without it, I would have been lost. I wish I had a sequencer that would let me see all the lines in colors on one graphic screen, like the old MIDI Paint program, or stacked up like a score sheet so I could see all the tracks simultaneously. You can simulate that with current sequencers, but it's kind of a tedious kluge. It's easier to simply lay out the blueprint on music paper, tinker with it if it's not right, and then follow this map like a person lost in a new city. That's how I popped it into the 12-track. And I built macros with QuicKeys, so that by tapping a number key on the numeric pad I opened up that track, turned everything off, and displayed its graphic representation in front of me. If I wanted to go into track 6 with this line, I hit 6 on the numeric pad, hit 6 on the A-DAM to record, and I was ready to go. I could see where it starts, and how much room I had for my echo; I could fade the echo if it was going to last too long because I could see on the screen where the next note on that track would come.

Was it important to maintain the feeling of organ performance in this piece?

I got a lot of comments from my friend Stephen Temmer; he's an organist, and he used to play this piece a lot. He mentioned places where most organists will shift this part by octaves in the bass, drag the pedals at this spot, things like that. I still insisted on places where I had to suddenly change tempos. If you play this at the same tempo, some parts sound too slow, while others are too fast. It's a toccata and fugue, after all; we can have a bit of fun with it.

There are some very subtle tempo fluctuations throughout the piece.

You bet. I put the tempo track in manually, one value at a time. There are places where I would take it down to maybe quarter-note equals 68, then pull it back up to 73, then maybe 76 for just two chords. I hand-entered all of these rubatos so that the original playing didn't have to get quantized; it could just sit there roughly on the grid. I could stretch or shrink that grid to do what I would want to do in a real performance, then take my original velocities and smooth them into the kinds of slopes you would get naturally with an expression pedal. If you go through the score as the piece plays, you can see how this brings it alive and makes the stereo field move. After all, this is thinner music: two hands and a pedal. In the *Brandenburgs* you've got ten musicians going; that kind of contrapuntal music cannot dance around the room in the same way without colliding with itself. From a stereo point of view, a piece like the *Toccata and Fugue* is a very different animal.

It must have been difficult to work within the free tempo of the Toccata.

On my first abandoned attempts in the '70s, it was a nightmare. There, with only one sound at a time, unlike the new instruments, I was finding 16 tracks to be constraining. One of the better things of working with Performer is that you can reach in on the screen and tweak a note or tempo when you need to. For example, these sounds acquired so much massive echo at climaxes that I couldn't bridge the sections as tightly as I had originally planned. I had to drop down to a very low metronome of 22 for a couple of beats to provide a breath before the next section came in. I made these adjustments while I was transferring it because I could judge only then when something came in much too soon. There was no click track on the tape; it was just synced to SMPTE. The tempo wasn't frozen as an initial track, like we used to have, so all of the things that would have led to last-minute compromises in the old days just didn't happen.

It seems as if there's a little pitch-shift in the end.

You think so? Maybe because the different instruments were reverberated at different times. This is the only piece on the album in which no reverb was applied during the mix. It was built into all the parts on the multitrack. Some of the instruments with rounder timbres had longer decays than others that were brighter, so the whole final chord evolves coloristically as it decays. In most places, I broke big thick chords down into many individual different tracks, like what an old monophonic synthesizer required, or like an orchestra. In other places, I doubled some of them, more like string quartet writing. And there's antiphony where these little bells sneak in and out. They're very soft; you almost don't notice that they're there, but you'd miss them if they weren't. Then there are places where one massive upper track suddenly becomes the lower voice, while the ones that were the lower voices become the upper voices. You get a redistribution of the parts in the sound field as the chords play through.

How did you create those antiphonal effects?

I tried a lot of ways. You can take advantage of the fact that you're changing the timbre. In some cases, I drew little diamond shapes on the score to indicate that this part is at a lower level here than on some other tracks, so when I transferred them to multitrack I'd make sure they didn't dominate. Instead, they'd create a slight pan-pot effect.

Hocketing — bouncing a part from track to track — seems to play an important role on S.O.B. 2000. *In your liner notes, you describe how you play the solo line in the* Sinfonia in D Major *linearly, then hocket it over four tracks.*

That was fun. I've made a couple of QuicKey macros that I use all the time. I call them Begin Bounce and End Bounce. The Begin Bounce presses Copy and then Remember Times, then activates the Tracks window, then presses the word Edit, which plugs the Remember Times into the in and out boxes, and it stops at that spot. With the mouse you then highlight the destination track and hit End Bounce. That one does a merge, then re-highlights the Originating Graphic or Events window and waits. The next step is to either tap Command B to erase those notes, so they vanish from the originating track and you're left with only the ones you haven't called to put somewhere else, or you leave them on the originating track and eventually bounce them somewhere else. It's a wonderful environment for all kinds of hocketing.

Obviously, this is an important difference between how you present melodies on the two S.O.B. *albums.*

Right. All of the melodic lines that were, in the original album, played strictly in mono on the center track can now dance subtly all around the room. In some cases, they're two

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different timbres moving in opposite directions at the same time, so you hear a timbral panning in which the hard attack moves to the right while the rounder bottom moves to the opposite side. That's much more sophisticated than a mere ping-ping, pong-pong, like the early days of stereophonic records. In that kind of hocketing, the timbre would be basically the same on both sides. The hocketing on the *Toccata and Fugue* changes timbre and position pretty often, so you have the feeling of a voice in motion in a way that you could never create if you had to depend on, say, only MIDI left-right pan-potting.

Another difference between the two S.O.B.*s is that the dynamics seem more extreme on the new album.*

No doubt a side effect of digital? I think it ended up a pretty good compromise. Too wide a dynamic range can be distracting, but too little and I would have wasted the whole idea of having it on CD.

Perhaps the big changes were in timbre rather than volume.

Timbral changes can certainly make more subjective effects of crescendo and diminuendo than you can get by mere decibels.

What were the roles of sequencer editing, velocity sensitivity, and aftertouch in creating dynamics and shaping the performance?

Velocity is used a lot. Every single part in whatever color relies on it. Sad to say, release velocity isn't available on most of my instruments. But controller 7 was used all over the place. That was a very major improvement to MIDI for my way of playing. In the Moog synthesizer days, much of the dynamics came not just from that mechanical velocity-sensing device that Bob Moog cobbled together for me, but also from the fact that my left hand constantly rode the gain. I would also have the Moog controller pedals change the brightness of the sound, so I could really make expressive dynamic shifts while I was playing. I could have done it in the same way on *S.O.B. 2000*, but although it was quicker to play, it made it much harder to edit because controller 7 was often fighting the velocity. I attempted in the editing to try to make it as clean as I could without losing the spontaneity that you get mostly on an early take. But I found that if I had velocity going up and down while controller 7 was going up and down, and then another controller, like controller 13, was shaping the brightness of the timbre up and down, at some point they started to fill up the MIDI bandwidth but cancel each other out aurally. I finally forced myself to put my "nervous" left hand on the keys and help my right hand along during wide passages. I did the best I could with velocity while trying to think of the slopes I was doing. Then I'd do an overdub just of controller 7, try to judge what it was doing to each note, and trim, point by point, each note's velocity. You can often polish the velocities from what you got by playing it by hand, not to overdo it, of course. But you also eventually get a performance that combines the best features of each method of expression.

Did you use controller 7 more on the slower or moderate-tempo lines than on the faster parts?

Sure. The slower the tempo and the longer the notes were held, the more controller 7 there was, and then controller 13 would come in to make the lines shift timbrally as well, so nothing would just sit statically. That's often a problem for pianists doing synthesizer work: The notes are fine as long as they're moving, but the minute they stop, you can tell that you're sitting on one waveshape and dynamic, or some other kind of rut. I tried to get around

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that as best I could. Slow things, like the "Air on a *G* String," have a lot of controllers moving up and down.

Using hardware MIDI faders?

Right. [JLCooper] FaderMaster is my constant friend. I have it right beside me at all times. With a JLC Expression Plus or MixMate added, you can use older synths that don't implement controller 7. The FaderMaster was how I controlled the MIDI functions inside the SY77. I built many patches in which, say, the filter cutoffs were addressed by controller 13. I had that on my FaderMaster, so I'd call up the voice, and it felt like I was working the old Moog: I'd just reach over and say, "How bright do I want this to be? How about sloping the attack?" In a primitive way, it felt like I actually had a knob where I could grab something musical and tweak it so it would work in a particular place without my having to go in there and tweak-edit. Jim Cooper has certainly been very important in providing the kinds of tools we need that don't seem to exist elsewhere. He custom-tailored my Expression Plus for me way back when. I couldn't have made this album without it or the MixMate. It's still a very clean-sounding unit, and just dandy for masses of mono voices playing one unison line, where I could dump one controller 7 line into that box and it would control several instruments but not clog up the MIDI. While transferring the lines, I also changed things with the controls on the [tc electronic] 2240 equalizer and with the [ART] DR1 MIDI-controllable reverb, although the EMT plate had to be reset. I could have made dynamic changes in the sequencer controlling MIDI variable-band equalizers, but that often becomes a slower, fussier way of working than just going in there and *doing* it. The important thing was to get it on tape.

In some cases, as on the Prelude in E♭, *you used the SY77 with a vocoder to shape the overall brightness.*

The SY77 and its offspring are neat devices. It's the first Yamaha device I can really sink my teeth into. In a way, I'm annoyed with Yamaha for not having gone whole hog and given us more [FM synthesis] operators, but they did implement many of the patches or algorithms I had asked them for. It allows you very easily to set up MIDI controllers to vary the brightness, either directly by modulating the FM or by changing the cutoff points on filters. You can set several filters to alter different things. It's a very rich, though intricate and often hard to control, way of allowing MIDI to alter stuff that you could do with the old Moog just by reaching up and grabbing a knob. So sounds can get brighter as they go along and then get duller again. That sort of thing is inherent in most acoustic instruments and styles of singing. In fact, it's the legacy of *all* music, and was sorely lacking in a lot of early electronic music. Early digital machines didn't allow it very easily, if at all. And the *E♭ Prelude* really needed exactly this kind of stately, careful control.

How did you use the SY77 sounds in that piece?

I was going crazy because I didn't want only the SY77's sounds — one device, after the rich palette of the rest of the record. So I fooled around and came up with an idea. The Synton [SPX 216 vocoder] has an extremely clean sound. I didn't think it would introduce any distortion or loss of signal-to-noise to take all of the brighter sounds from my other synths, put them into the 216's carrier input, and then use the SY77 both as the speech-modulation voice input for the vocoder and directly in the mix. You can control its brightness variations easily with controller 13 from the FaderMaster,

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and build that element to insert some life into the sequenced long-held notes in the performance. When it got louder, it might grow brighter, but then it would get duller while remaining loud. Then it could get softer, while the brightness might increase. The SY produced these subtle interplays very nicely, and the vocoder imposed those qualities on the other sources, which were chosen to be bright, with maybe a little Aphex and equalization to get them even brighter. That way, you had extra high frequencies that the vocoder could remove when you didn't want them or let come through when you were going for a crescendo. I was able to treat it like a MIDI-controllable Moog filter on all the synth voices.

You mixed in the four-channel Dolby Surround format.

Actually, it's a bit of a compromise in that respect, because when simultaneous events occur all around the Dolby matrix, you lose some of the directionality. But if you gently stagger the entrances to come in first here, then there, at one spot or another, the matrix immediately picks that up, and the Pro Logic will gate it to that location to recreate a surround effect, as it does for films. Whether you've got a big Pro Logic system, whether you've got a center speaker or you're just using the left and right speakers with a ghosted phantom center, the ear is still provided with enhanced directional cues.

On this album, the surround effect works particularly well on the *Toccata and Fugue* because at most there are three lines at a time — two manuals and one pedalboard. And the echo and ambience are a part of those tracks, not blended in during the mix, so they move around with the voices, which makes it easy for the Pro Logic to poke everything out of the right speaker at the right time. When you encode in the Dolby matrix, anything that's in the surround channel, the back channel, is encoded as L-minus-R; it's out-of-phase information. On mono radio or over any monophonic system, you lose that channel completely. So I took a little of the surround, slightly equalized it, put it into a slight delay, and then dumped it up into the front channel at a low level so that such parts wouldn't be completely gone if you listen in mono. By being in the opposite channel, that information doesn't

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steering of Pro Logic, as it can if you put it on the left and right channels. If I heard anything out of balance in spots on the two-channel reduction, like echo being soaked up a bit, I could add a little more there. The four-track digital tape submaster went through this adjusting, through the [Dolby] SEU-4 encoder, and was stored via DAT, digitally fed back and forth into [Digidesign] Sound Tools. There was one file for each piece. I called these up in Master List and did my first assembly. Then, returning to Sound Tools, I did my final touch-ups, balances, and EQs, and again in Master List output the final two-track master over AES/EBU to DAT — all pretty standard procedure by that step.

Why Sound Tools instead of Pro Tools, which you had used on previous projects?

I started to use Pro Tools when it first came out, and it looks first-rate. At that time, though, it was very buggy. Larry Fast told me that the best way he found for a CD master was to store the sounds using Sound Tools, and then use Master List to stack them together, check the spacing and the levels, and even come up with a printout sheet that can be used by the CD mastering plant. Sound Tools turned out to be far more dependable than Pro Tools. It can use the same hardware, and that Pro Tools interface box is the sweetest-sounding A-to-D and D-to-A I've heard in a long while.

Did you have any problems with the Akai A-DAM 12-track digital tape machine?

It's a very exciting, easy-to-use machine, now that I've got it running through this special output chassis that I built. It contains a dozen high-quality audio transformers, one for each output. As Bob Moog says, audio transformers are a great tool. Manufacturers hype us that they sound bad so they can make cheaper, non-transformer, all-electronic circuitry, simulating the transformers. But a good transformer, especially when you're only going through it one or two times, is transparent; you just don't hear it. They have very high headroom, are essentially noise-free, and gracefully handle whatever the load is — unbalanced, balanced, or anything in between. So that's how I finally got the A-DAM to work properly with my unbalanced console and system, and it hasn't given any problems at all.

But there's this funny set of input diodes

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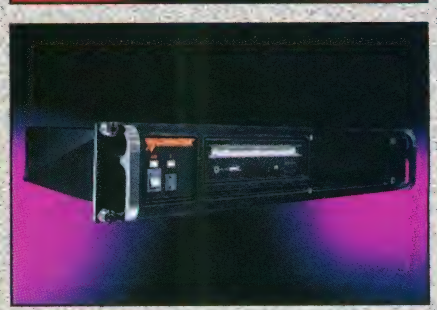

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on each channel instead of an audio transformer, just before it goes through the A-to-D, such that if the power is off, those diodes make a load on anything they're plugged into. So you have to remember to disconnect it when it's off, or you hear gross distortion. And I ought to point out that similar problems with the inputs and outputs of recent recorders and other equipment, not just Akai, are becoming common. Even though these are wonderful devices, it may be a good idea to keep a few spare audio transformers around, or encourage manufacturers to *put them back in*. They fix all these difficulties simply and easily. I'd been using the Symetrix 511A [noise reduction unit] with about 5dB downward expansion and a touch of dynamic filtering to clean up any remaining synth or RF noise; this is way down near -80dB. The final digital master during the mix sounds so clean that I don't need to mute anything or de-noise the mix. It's a very wide dynamic range because the multitrack has no glitches and no hiss in places where a given track is meant to be silent.

So the A-DAM worked out well?

Despite the installation problems, my fears about dropouts or glitches were groundless; there weren't any. You get used to the head cleaning process pretty quickly, so the preventive maintenance was very simple and quick, which was a happy surprise. However, at first I found it awkward to work with a tape machine that uses its own time locator in minutes, seconds, and frames, while the sequencer used measures and beats or SMPTE. Then I had a lucky brainstorm. By a little trial and error, I halted the Akai at the spot where the SMPTE on its cue track went to 1:00:00:00. I pressed the Relative mode button and zeroed the display. Now it read 0:00:00. I tried sending it to park at some location — say, 1:03:14. It did, and the SMPTE stopped at 1:01:03:12 — pretty close, if you ignore the one-hour left digit, which is mostly used as a reel marker.

What accounts for that small frame difference?

SMPTE goes by at 30 frames a second, the A-DAM at 35. So I typed up a brief chart showing the frame count equivalent at 35 fps for each of the possible SMPTE frame numbers, 0 to 29. It's really just a number table of the ratio of 35 to 30. This was a superb breakthrough. I could place Performer's cursor just before a note I wanted to punch in on, read the SMPTE, and, using the table, type in the equivalent location for the Akai to autopunch

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in on. It worked like a bandit. Let me tell you, the thing can go in and out on a dime, no glitches, and with the Rehearsal button, you can check it out first. It felt like the 12-track was now part of the Mac and MIDI setup! I wish all multitracks could be addressed using SMPTE directly. Perhaps someday.

There are some big dynamic changes on the album. Did you have any problems with clipping?

As you know, if you let the little red light barely flick at certain points, usually there's no audible clipping. That's only the 16th bit triggering on. PCM is often only allowed to be a 15-bit format, but with care you can let it be a full 16 bits. I went back in Sound Tools and saw where it flagged possible overloads. There were two cases that were real overloads, and they were both on extremely sharp spikes. They were so tiny that you couldn't hear them. So I used Larry's suggestion: I took the pencil tool and redrew it back just the tiniest amount, using smoothing on it so there was no longer any indication that I may have clipped a couple of values. Sound Tools really worked fine for level rebalances and touch-ups on equalization. I got really excited about it. It was my first chance to do something that probably a lot of *Keyboard* readers have done many times. I'd already done some of this with Pro Tools, so it seemed like much the same thing on Sound Tools, except only two tracks.

What were your last steps on this whole project?

The usual, no doubt. I cloned the master a couple of times for safety, and made an extra one for myself. Then, with the job finally done, I felt that funny twinge everybody who does this kind of a job knows. There it was, over 3,000 hours of work, and I end up with something that's barely two cubic inches in volume. It's like, What? This little box is over a year of my life? It was easier in the old days: You had a stack of massive two-inch reels, and you mixed them down to formidable four-track on half-inch tape, and then two-track on still-heavy quarter-inch tape. But on *S.O.B. 2000*, the paper for my liner notes weighed more than the DAT!

Now that you've survived another massive Bach endeavor, what are your feelings about the music he's left for you and others to explore?

It's funny. I've known these pieces for so long, from having done them so many times, that I almost think of them — don't laugh! —

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"I wish I could have had this 30 years ago!" *R.B., voice*

"It feels like I'm singing and playing 'my' notes instead of 'somebody else's' notes—like music is more 'my own.' Improved delivery because of being able to make more natural music." *L.H., voice/guitar*

"In three short weeks I've noticed a vast difference in my listening skills." *T.E., guitar*

"The information I received was worth more to me than most of the instruction I had received up to that point. Everyone who plays must know about this." *J.T., guitar*

"I never before thought it was possible to obtain Perfect Pitch, but now I know it is." *T.S., piano*

"Someone played a D major chord and I recognized it straight away.

"I enjoy listening and playing more and I get new musical ideas as a result." *S.C., guitar, bass*

"I began to transcribe Queensryche *Silent Lucidity*. It seemed simple. I forgot about it until I happened to be in a music store and saw a $25 book with the song in it. It was transcribed totally wrong from the way I figured it out.

"Then I picked up one of the recent guitar magazines. It was exactly the way I transcribed it months ago. Let's say that I grinned like a little kid with candy. *D.O., guitar*

"It's like hearing in a whole new dimension." *L.S., guitar*

"I'm able to play things I hear in my head a lot faster than ever before. Before I started the course, I could barely do it." *J.W., guitar, keyboards*

"It's so simple it's ridiculou *M.P., guitar*

"I can listen to a song and still hear it hours later in my mind."

"After just a few minutes of your instructions, I could locate an F♯ by ear—even when it was hidden in a group of several tones!" *G.B., synthesizer*

"You can imagine my joy when I listened to your tapes for the first time, went to the piano, and make the startling discovery of Perfect Pitch! I started crying and laughing all at the same time." *J.S., educator*

"Mr. Burge has given me the key to what I once considered a closed door." *D.H., Ph.D., voice/piano professor*

"I believ It works just because it's so simple." *S.P., sax*

"When I heard the first tape I could hear the pitch color differences Mr. Burge described. At first I thought it might be my synthesizer, so I tried other synthesizers. I could still hear the differences.

"Now I listen more carefully to the sounds of the notes and how they blend together. While working on a piece I was writing, all of a sudden I heard the pitch color of each note. I revised the piece immediately. I'm much happier with it now." *W.H.P., synthesizer, guitar*

"Perfect Pitch is an invaluable asset in my musical career. I feel if every musician could hear as I do, they would realize how useful it is and how delightful." *H.M., voice*

"It brin root of *R.C., p*

"It's hard to describe. It's like hearing more of the piece or the different feelings evoked because of the key it's played in.

"I can listen to myself better and hear what I'm doing, allowing me to express myself better.

"It's amazing how easy and simple Perfect Pitch is. After understanding it, it was like the pitches were at the 'tip of my ear.'" *C.L., piano, guitar*

"All music listening is improved quite markedly on the level of happiness, as you pointed out on one of the tapes." *S.H., jazz guitar*

"Never again will I listen to music as before. My playing has improved and I am able to easily transcribe note-for-note many Eric Clapton songs I had wanted to for so long." *H.K. guitar*

"The life and breath of feeling part of what we play can be more fully experienced through this knowledge of Perfect Pitch." *D.S., piano*

"I hear a song on the radio and I know what they're doing without my bass guitar.

"My improvisations have improved. I feel more in control of what I'm doing." *I.F.B., Costa Rica*

"It all boils down to taking the time to listen." *M.B. piano*

"This is absolutely what I have been searching for." *D.F., piano*

"I am convinced that a finely tuned ear is the greatest gift that I could ever give my students." *J.F., music teacher*

"This course could replace, or at the very least, cut in half the time lavished on seemingly obsolete ear-training courses currently taught." *M.S., music teacher*

"It's strange how some things that seem so hard are so simple." *D.W., flute*

"I used to sleep in instead of practicing in the morning, but since starting your course I haven't skipped one day. My improvisations have improved." *M.S., piano/synthesizer*

"Perfect Pitch for a musician is more valuable than gold." *E.V. guitar*

"Although I was at first skeptical, I am now awed." *R.H., sax*

"I can't understand why it's remained a secret for so long." *B.T., music student*

"A few days after starting the course the music did seem more colorful and vibrant." *L.P., guitar, Australia*

have already acquired abilities I never reamed of having 2 years ago, as well as an

"Last Tuesday night in rehearsal I was lis tening to the

"Mr. Burge—yo have changed my life!" *T.B. guitar*

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as my own music. As I was working out decorations and arrangements of the pieces, writing my own portions, or playing out the music, it almost felt like there was no boundary between where it was performance or composition. There were moments when I'd think, "You know, that measure would be a little more effective if I inserted an extra two beats, perhaps a fermata. . . . Wait a second! This isn't my own piece!"

Why do you think that more artists aren't doing electronic realizations of classical repertoire?

Who knows? I guess it's gotten harder to do that now than it used to be, since this record took approximately three times as long to do as the first one did. The new tools are like a sharper scalpel. If you, as a painter, are stuck with using only a tiny brush, that would slow you down when you try to make large shapes. It's the same thing in what we're doing: The tools of the trade have gotten much more close-up. They let you see the branches of the tree superbly, but not the tree itself, let alone the forest. So I expect to find fewer people trying to do things like Bach, because it's going to take a lot more persistent time and effort to get through such a project than it would have in the old days.

How much further can the technology of minutiae lead us?

Ultimately, I hope, we'll be able to tweak the overtones, and to balance exactly the ambience of all the instruments in the ensemble, how they're reflected in the acoustic frame in which you're sitting. Which means that you're going to have to wear a lot more hats than you're already wearing. Again, if you were a painter, it would be like gathering berries and

Continued on page 107

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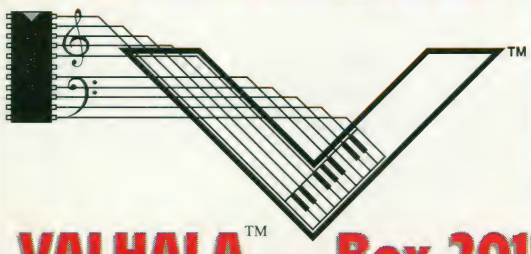

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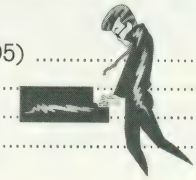

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Continued from page 102

roots to squeeze out juices for the pigments you need to make your own paint, and then collecting hairs and bristles and tying them together to make your brushes, and weaving the cloth and starching it in a frame to make your own canvasses. You'll have massive amounts of control, but you'll lose the time and efficiency that mass production can give you.

The learning curve, in other words, will only get steeper.

That's probably right. It shocks me to realize that you'll have to keep reinventing yourself as you go along with the medium. Most of the skills we have from the old days at least have to be translated, and in some cases abandoned. We don't edit tape with a razor blade anymore. Now you've got non-destructive editing, which is great. But it does mean that you can use prior skills only indirectly.

What sort of critical response do you expect to S.O.B. 2000*?*

I expect a fairly polarized reaction, similar to what the first album got. Really, those responses were barometers of how secure people felt about their music or the technology. Musicians who were very threatened were clearly afraid that something they didn't understand might make them obsolete. They attacked *Switched-On Bach* in a way it didn't deserve to be attacked, because it wasn't that important — or, really, even that good. The new album will probably get other extreme bipolar reactions, though not nearly as electric because we're all innundated by synthesizer sounds of one sort or another these days. In truth, that's the biggest change over the past quarter of a century. When we did the first *S.O.B.*, it was with an almost private technology that very few others had access to. Today, anyone can collect the same sort of instruments that I used on *Bach 2000*. It's a wonderfully more democratic musical world we now live in. *Anyone* out there could, in principle, do an equivalent project to this one, with a little inspiration and a lot of perspiration! Still, releasing an album, especially something as exhausting as this, is like winding up this little toy, putting it on the floor, letting go, and watching it go off. You wonder if someone is going to step on it, or want to get one of their own. And I'm looking out from the wings with curiosity and apprehension. ■

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WHAT PRICE SPEED?

OUR WORLD IS IN A CONTINUAL state of growth and change. Nowhere is this more evident than in the world of computers and technology. While manufacturers struggle to retain their share of an ever more competitive market, they continue to focus on the two main ingredients that make a good computer: ease of use and speed. Whether you are looking for a new computer or are interested in upgrading your present one, keeping up with the fast pace and constant change of micro-technology is practically a full-time occupation. (Trust me on this one!)

The typical computer user is constantly seeking ways to upgrade to a "better, faster" machine. But at what cost? We all would like to have the *créme de la créme* computer gracing our studio, but few of us have the resources to pay the price. Although the price/performance ratio has decreased significantly over the past few years, you had still better be prepared to shell out a good amount of cash for the luxury of warp speed.

Whatever your platform of preference, faster computers are continually appearing. Simultaneously, there are a plethora of ways to upgrade your current model. Here's the latest performance-enhancement news from the big three.

Apple. Apple has unveiled their fastest Macintosh yet, the Quadra 950. Although incorporating a 68040 33MHz microprocessor (a chip that's a third faster than the 25MHz 68040 in the Quadra 900 and 700), Apple has done more than swap chips. The I/O bus clock speed has been increased from 15.66MHz to 24.28MHz, and they have installed a faster Ethernet chip for networking, which they claim results in as much as a 20% improvement in performance. The Quadra 950's VRAM (video memory) is faster than that of the Quadra 900 (80 nanoseconds vs. 100 nanoseconds), and there's more of it: 1Mb of VRAM is standard, so you can get 16-bit color on Apple's 16" display and 8-bit color on the 21" model (video electronics also support SuperMac's video timings). Increasing the VRAM to capacity (2Mb) allows you to get 24-bit color on 16" monitors. However, a video card is still a requirement if you want 24-bit color on monitors larger than 16".

The Quadra 950 comes with more memory and more storage, too. Probably the best news is that, while Apple has added 4Mb of RAM to every configuration that was available for the Quadra 900, every configuration of the Quadra 950 costs exactly the same as the comparable 900 configuration. A faster 230Mb hard drive replaces the 900's 160Mb unit. Apple's prices break down as follows: 8Mb RAM/1.44Mb SuperDrive: $7,199; 8Mb RAM/230Mb hard drive: $8,499; 8Mb RAM/400Mb hard drive: $9,199.

Getting into a faster Mac doesn't necessarily mean buying a new one. One of the best ways is to install an accelerator board, which replaces your machine's processor and memory with faster versions. However, if you have an earlier machine, like the Mac Plus, it may be more cost-effective to simply replace it with a faster Mac.

Most accelerators use the Motorola 68030 processor found in the Mac IIx, IIcx, IIci, IIsi, and IIfx, or the 68040 found in the Quadras. Over a dozen companies currently offer various accelerators for the Macintosh, each varying in speed and additional RAM. 68030-based accelerators range from $325 (16MHz for the Mac Plus and SE) to $2,299 (50MHz for SE/30, LC, II, IIx, IIcx, IIci and IIsi). 68040-based accelerators are priced from $1,187 (25MHz for the Mac LC) to $3,295 (33MHz for II, IIx, IIcx, IIci, IIsi, IIfx).

Whether to get a 68030-based or 68040-based accelerator is one of the toughest decisions for a Mac owner. The 68030 supports an add-on 68882 floating-point unit (FPU) math coprocessor, which can dramatically speed up certain number-crunching applications — like spreadsheets and rendering programs — but does not make a significant difference in speed when running MIDI programs. The 68040 chip essentially combines the 68030 processor and 68882 FPU, and adds larger instruction and data caches (these store frequently used commands and data). Although these changes improve performance, they also reveal compatibility problems with some software (programs like Aldus PageMaker and Microsoft Excel had to be updated for compatibility). The problem is due to the 68040 data cache's way of storing commonly used data. Some boards come with software to detect compatibility problems and automatically switch to running with the 68040's cache turned off.

Atari. The engineers at Atari have always designed their products with the idea of "power without the price." It looks as if their latest model, the 68030-based TT030 computer ($2,299.95, with 2Mb RAM/50Mb hard drive), has delivered that message loud and clear once again. Running at 33MHz, the TT030 is further accelerated by using TT fast-RAM for speedy data-transfer to and from disks. An AppleTalk port provides for networking with Macintosh computers and other Apple peripherals. The TT also features stereo audio outputs, internal SCSI as well as an external SCSI expansion port, a DMA port, and a 50-pin VME bus expansion slot. Running under Atari's latest 3.06 version of the TOS operating system, the TT030 offers fast-and-friendly service like no other Atari before it.

ALTHOUGH THE PRICE/PERFORMANCE RATIO HAS DECREASED OVER THE PAST FEW YEARS, YOU HAD STILL BETTER BE PREPARED TO SHELL OUT A GOOD AMOUNT OF CASH FOR THE LUXURY OF WARP SPEED.

When Atari first introduced the TT030, some compatibility problems accompanied it, especially when it came to running MIDI programs. Now that the TT has shown everyone it's got the right stuff (baby!), it's finally getting the support it deserves from MIDI software developers. Steinberg's Cubase was the first sequencer to be updated for TT compatibility, and other companies such as Oktal and Hybrid Arts were close to their own releases at the time of this writing.

CodeHead Software has released a new version of their Atari software accelerator — Warp 9 version 3.6 ($44.95 — formerly known as QuickST). The new version now handles the VDI and Line A "raster copy" calls, which are often used for window scrolling. When Warp 9 is used on a non-blitter chip Atari, a dramatic increase in speed is seen in most scrolling applications, including WordPerfect (200% faster), STeno (300% faster), and Calligrapher (30% faster). Blitter-equipped Ataris will not exhibit so noticeable an increase,

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Geoffrey Ryle is a MIDI/computer consultant in the L.A. area. He is also the author of The Official Cubase Handbook *and editor of* Cubasics, *a bimonthly newsletter dedicated to the same program.*

COMPUTERS ON-LINE

but still perform slightly faster when running Warp 9. The update also provides automatic control over Warp 9 options. This means that you can easily disable some or all functions automatically when running a non-compatible application. Version 3.6 provides long-awaited compatibility (although slightly limited) with Cubase, and problems with C-Lab's Notator have been resolved as well.

Accelerator boards are also available for the Atari ST, similar to those described above. However, because of the price of these units, it is recommended to first consider upgrading to a faster Atari computer altogether, such as the STe, Mega STe, or TT030. Accelerator boards may cause problems with programs that incorporate a hardware "key" as copy-protection. The key responds to the program when it is launched; but if no response is detected, the program will not run. However, the accelerator pushes these programs to a speed that is too fast to read the key's data, since the key takes the same amount of time to respond. In other words, the key can't respond fast enough for the computer to see that it is there. Some accelerators come with software that allows you to disable the cache, which can sometimes solve the problem. If it doesn't, you'll have to switch the accelerator back down to the slower speed when you want to run such programs.

PC Compatibles. Meanwhile, back in the world of PC compatibles, more than 20 companies have released new 486-based machines that claim to be the fastest PCs ever. Running at a blinding 50MHz, Intel's new speed demon 486 microprocessor runs as much as 30% faster than their previous 33MHz 486. Even better news: Systems based on this chip are selling for the same price a 486/25 system was selling for a year ago. Compared with today's 486/33 PCs that are similarly equipped, you pay 10-20% more for 30% more performance. So while these systems are not cheap ($3,000-$14,000), they are still an excellent price/performance value.

If you're looking to speed up your present system, you have a few options available. However, the older your computer is, the more it will cost to get where you want to go. Acer offers a single-chip upgrade that pushes a 386SX system to 486 speeds at the unbelievably low price of $175. The Intel 486DX2 chip ($739) replaces the older 486DX model, and doubles the internal clock speed. So while the system is actually running externally at 25MHz, you can still enjoy 50MHz performance internally. Other upgrades cost anywhere from $500 to $1,500 and can involve swapping the mother-board. In some cases, you'll also need to replace the computer's power supply to meet the requirements of these new components.

If you're running Windows, you can boost your monitor's refresh rate by adding a graphics

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accelerator card (from $349). Western Digital and ATI Technologies are among those that offer AT-bus cards that can provide higher resolution and more colors, and dramatically increase the power of your Windows applications.

If you're running an older system, you might consider upgrading to a new computer. However, that isn't necessarily going to be as expensive as it may sound. For around $1000, you can purchase a new 486/50 basic system, including mother-board CPU, 1Mb RAM, IDE controller, your choice of 1.2Mb or 1.4Mb floppy drive, extended keyboard, chassis, and power supply. All you do is transfer your VGA card and monitor (plus any other peripherals, like an MPU-401 MIDI interface), and you've got one of the fastest PCs on earth. But beware of people selling cheap systems and upgrades out of their garage. Lots of people are going into business by piecing together components they bought used, and selling them at ridiculous prices. Although they may seem like a deal, the price is usually a reflection of the quality of components being used, the warranty (or lack thereof), and the service you can expect if something goes wrong. Many of these "bargains" do not have FCC Class-B approval, which means when you turn on your system, you and your neighbors could experience interference with radio and television reception (not a great way to make friends).

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Speeding up your system isn't just a matter of upgrading the microprocessor. There are many factors that can have an effect on computer performance. Adding memory lets you take advantage of helpful utilities, like a RAM disk. When you purchase RAM, make sure to look for components rated at 80 or 70 nanoseconds. Many older computers were fitted with 100 to 120 nanosecond RAM chips. A fast hard drive is also essential. Some are rated at access times as fast as 13 milliseconds. If you are interested in recording digital audio into your computer, you must have a fast hard drive with plenty of storage space for your work.

One final note: As a musician or engineer, you may be getting used to the idea of planned obsolescence. When MIDI was introduced, that idea almost disappeared since any keyboard with a MIDI port would technically never become obsolete. Such is the case with computers. Although you may think your humble Mac SE or 286 is becoming an endangered species, there are plenty of companies that offer ways to keep up with the rest of the pack. Of course, there are always those who demand to have the very latest technology at any cost. If you have the wherewithal to do so, I salute you. By the way, could you spare a couple o' bucks? There's this cute little 68040 accelerator I've had my eye on and . . . oh! Well, thanks anyway; just thought I'd ask. ■

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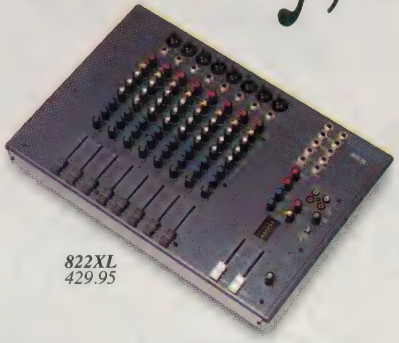

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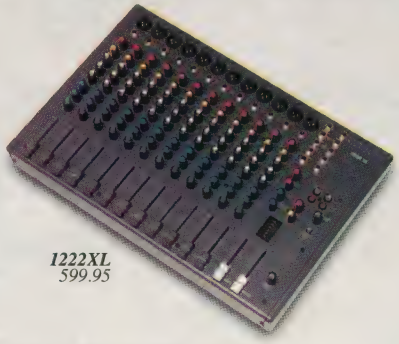

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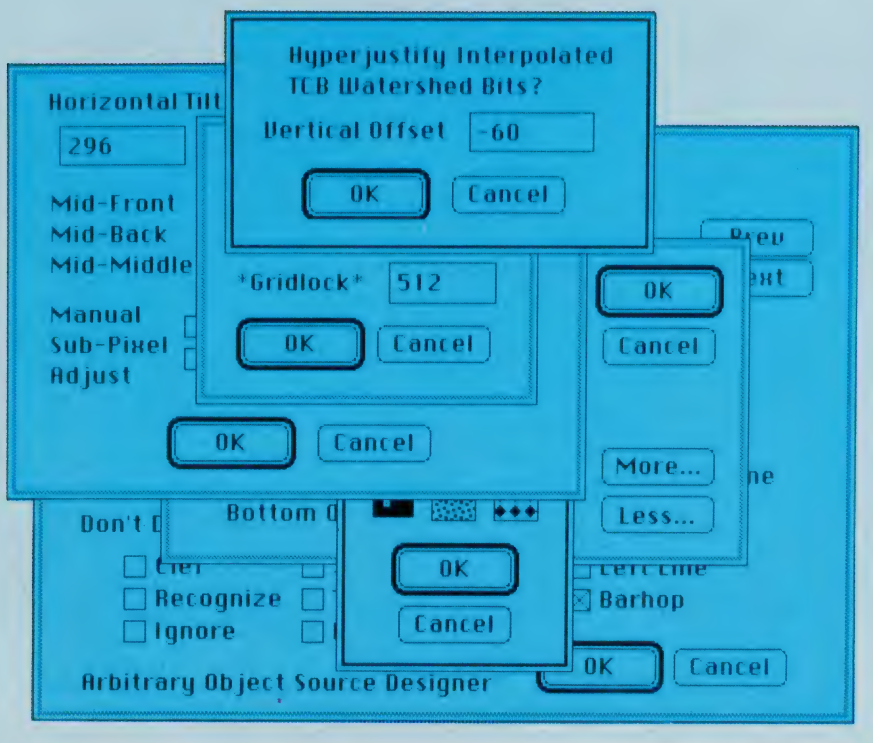

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BASICS

JIM AIKIN

SEQUENCERS, PART 2: TRACKS & PPQ

IF YOU USE MIDI IN YOUR MUSIC, and if you plan to make recordings, you're almost certain to find yourself working with a sequencer sooner or later. Sequencers are incredibly powerful tools for creating music — but along with power comes complexity. Manufacturers go to a lot of trouble to make sequencers as user-friendly as possible. Even so, the sheer number of features that can be put in a sequencer, to say nothing of the many possible musical needs that various players might have — well, it's mind-boggling, that's all. To put such a proliferation of concepts into perspective would take a hundred times more space than we have in this Basics column.

So we'll confine ourselves this month and next to a quick tour of three or four absolutely fundamental ideas. If you'd like to see more on the basics of sequencing, write to *Keyboard* and let us know. Maybe we can devote a couple of extra columns to these topics early in '93.

What is a track? While you'll find buttons on a sequencer, just like those on a tape deck, labelled 'play,' 'record,' 'fast forward,' and 'rewind,' the guts of a sequencer are very different from the guts of a tape deck, as we discussed last month. (For one thing, a sequencer records MIDI data, not sound itself.) Even so, by building a sequencer so that it looks like a tape deck to the user, we can create a powerful, convenient, and familiar environment for recording music.

Like a multitrack tape deck, a typical sequencer provides a number of *tracks* on which music can be recorded. Most sequencers have at least 16 tracks, and many offer hundreds of tracks. Like the tracks on a spool of tape, the tracks in a sequencer can be put into record mode one at a time, and other tracks will play back while the new one is recorded. You can build up a complex piece of multitrack music by recording it in a number of passes; you're limited only by the maximum polyphony of your synth modules. As each track is recorded, you can listen to the existing tracks playing back, which allows you to play in time with the other tracks. You can "punch in" on a sequencer track just as on a tape deck, recording new music during one section without disturbing the music before and after it on the same track.

Sequencer tracks operate as if they were running parallel to one another on a wide piece of tape and all passing across an imaginary "playback head" at the same speed. So if you tell the sequencer to start playing at, say, bar 17, you'll hear whatever has been recorded on all of the tracks starting at that bar. On a tape recording, the tracks stay "in sync" with one another because they're physically located next to one another on the same piece of Mylar. In a sequencer, you get the same result — bar 17 on all tracks is followed by bar 18 on all tracks, and so on. But in fact there is no *physical* connection between the tracks. This lets you do various neat tricks, including "track shift," a feature in which one whole track is slipped forward or backward slightly in time in relation to the other tracks.

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SEQUENCER TRACKS OPERATE AS IF THEY WERE RUNNING PARALLEL TO ONE ANOTHER ON A WIDE PIECE OF TAPE AND ALL PASSING ACROSS AN IMAGINARY "PLAYBACK HEAD" AT THE SAME SPEED.

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Like tape tracks being played back through the channels of a mixer, sequencer tracks can be individually muted. You can mute several tracks at a time in order to listen more closely to certain parts, or you can record several 'takes' of a part on different tracks and then unmute one take at a time while muting the other takes, so as to get a clear idea of which version you like best.

In addition to their mute/unmute buttons, sequencer tracks generally have other kinds of controls. Depending on what sequencer you look at, you may find a transpose control for moving the pitch of the track up or down in half-steps, a program change control for sending a new MIDI program change command to the synthesizer that is playing the notes recorded on that track, or a velocity adjust control for increasing or decreasing the key velocity of the whole track to make it louder or softer. Each track will have its own complete set of these controls, and perhaps some other controls as well.

It's important to understand the distinction between *tracks* and *channels*. MIDI provides 16 channels, so that up to 16 different musical parts can be carried by a single MIDI cable. Usually, a single sequencer track is assigned (using one of the track controls) to a single MIDI channel. But not always. Many sequencers will record and play back multi-channel tracks. In this case, a single track could have MIDI data on up to 16 different channels, and be playing a number of different musical parts all at once.

On the other hand, you could have two or more tracks assigned to the same MIDI channel — a four-voice chorale where all four voices are playing the same choir patch on a single synthesizer, for example, or three melody phrases that follow one another in a single verse. The reason to assign the parts to separate tracks is because it makes them easier to edit.

Still another difference between channels and tracks: Some sequencers offer two or more separate MIDI outputs. In this case, the sequencer might be able to handle 32, 64, or even more MIDI channels. But just because a sequencer has 32 or 64 tracks, you should *not* assume that it will address the same number of channels. If you're using 64 tracks but your sequencer has only one MIDI output, then several tracks will always be playing music on the same MIDI channel(s).

What does "ppq" mean? As we discussed last month, a sequencer records MIDI data by "time-stamping" each incoming MIDI message. The sequencer has an internal clock, which runs faster or slower depending on the tempo you select. Each time a message arrives, the sequencer looks at its clock and then stores the message in memory along with a number that tells what

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Jim Aikin was the slowest kid in P.E. except for the fat kid. He much prefers MIDI tracks to the kind with scuffed-up chalk lines on them.

time it was when the message arrived.

Obviously, in this situation, the sequencer needs an accurate clock. The more accurate the clock is, the more accurately the music can be recorded and played back. Now, a sequencer's clock doesn't typically slow down or speed up very much unless you change the tempo, so we don't need to worry about that sort of accuracy. What makes a difference is how accurately the sequencer can measure the tiny intervals of time that make up an expressive musical performance.

Here's an analogy. You're out on the track running the hundred-yard dash, and down at the other end of the track stands the coach, with a stop-watch in his hand. He's going to time your performance. In order to get a good idea of exactly how fast you are, the coach has to have a hair-trigger thumb on the button of the stop-watch. If he can only press the button once a week, or once a day, or once an hour, you might as well go back to the locker room. Running a time trial would be pointless. Once a minute? Not fast enough. Once a second? Still not fast enough to time a hundred-yard dash. You'd like him to be able to press the button of the stop-watch a hundred times every second if he needs to. That way, he can hit the button at *exactly* the moment when you cross the finish line, so he can measure your performance accurately.

In the same way, a sequencer needs to be able to split time up into lots of tiny intervals, in order to register as accurately as possible when each MIDI event arrives at its input jack. Because it's a digital (computer-based) device, a sequencer is not capable of recording time information like, "Sort of two-thirds of the way between 1.26 seconds and 1.27 seconds, but a little early." Everything that happens in a computer, including time, is represented as an exact number. If the recorded time of an event is slightly different than the actual time of the event, the sequencer never knows it. On playback, it plays the event at the recorded time. The accuracy with which a sequencer can play back your musical performance can never be any greater than the accuracy with which incoming MIDI data is time-stamped. If large errors are introduced at this point, the playback will sound stiff or sloppy. (Small timing errors can also creep in if the sequencer's operating software is badly written, if the music is especially dense, or for other reasons.)

The term *pulses per quarter-note*, abbreviated "ppq" (or sometimes "ppqn") is a standard way of describing how accurate a sequencer's clock is. If a sequencer is capable, at best, of dividing the length of a quarter-note up into 24 little time-slices, we say that the sequencer has a *clock resolution* of 24 ppq. If it divides the quarter-note into 96 segments, it has 96 ppq resolution.

As you can see, this number (which is also called the *timebase* of the sequencer) relates to the value of a quarter-note. If we speed up the tempo of the sequencer until it's running at 250 bpm (beats per minute), the individual clock pulses within the quarter-note will be a lot closer together, no matter what the ppq value is. At 25 bpm, the pulses will be a lot farther apart. By the way, this gives you an easy way to get better performance out of a sequencer that has a lower ppq value. By doubling the tempo and then playing normally, you double the ability of the sequencer to capture the time nuances of your performance. The sequencer thinks you're playing half-notes when to your own musical way of thinking you're playing quarter-notes. Each of your quarter-notes takes up twice the number of sequencer clock pulses, so the clock resolution is effectively doubled.

Many older MIDI sequencers and drum machines had a clock resolution of only 24 ppq. This is a coarse resolution, and gives the music a slightly mechanical feel. The minimum standard for newer devices is 96 ppq. A sequencer that operates at 96 ppq provides enough timing accuracy for many types of music, but professionals usually demand a sequencer that operates at 192, 240, or even 384 ppq.

Is it possible to hear that a particular note has been moved forward or backward by a single clock pulse at 384 ppq? That depends not only on how picky you've trained your ear to be but on other factors, such as the tempo and the nature of the music itself. Maybe someday we'll devote a whole Basics column to the issues of time perception. Next month, we'll finish up our series on sequencers with a look at quantizing and other types of editing. ■

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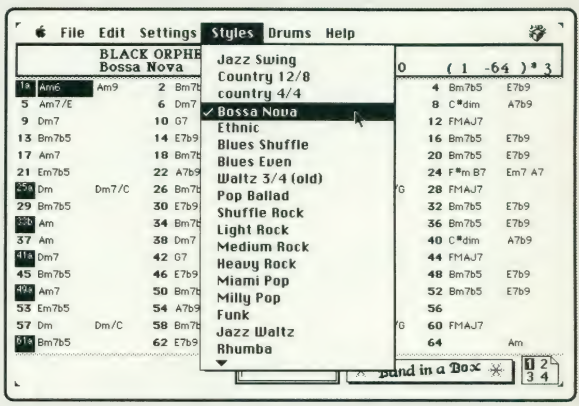

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IMPROVISATIONAL PIANO

ROBERT L. DOERSCHUK

LITTLE RICHARD & THE ECSTASY OF ROCK

THERE'S NEVER BEEN ANYONE LIKE Little Richard. Though he didn't sell as many records as some of the white artists whose covers of his songs are too embarrassing to dwell on, his impact on music was as devastating as a hurricane on the Carolina coast. In every aspect of performance, from the way he dressed to the notes he played and sang, Richard split pop music in half. Everything we discuss in this column, and for that matter everywhere else in this magazine, falls into either the Before or After Little Richard eras. His influence is something to celebrate or mourn, depending on your tastes. But it is certainly undeniable.

Of course, it is possible to place Little Richard Penniman on an evolutionary continuum. In a sense, he does represent just one step in the development of what is essentially a blues piano style. In particular, much of what Richard played reflected the New Orleans style of piano explored in previous Improvisational Piano columns, down to the "Spanish tinge" first noted by Jelly Roll Morton and later embraced by Professor Longhair and his disciples.

What made Richard different from those who came before him was more attitudinal than musical. All pre-Richard jazz and blues pianists operated from a standpoint of control. From the Gothic constructions of Art Tatum to the rolling octaves of Jimmy Yancey, each performance was consciously executed by an artist whose primary focus was musical. In this sense of dedication to their craft *as pianists* and their

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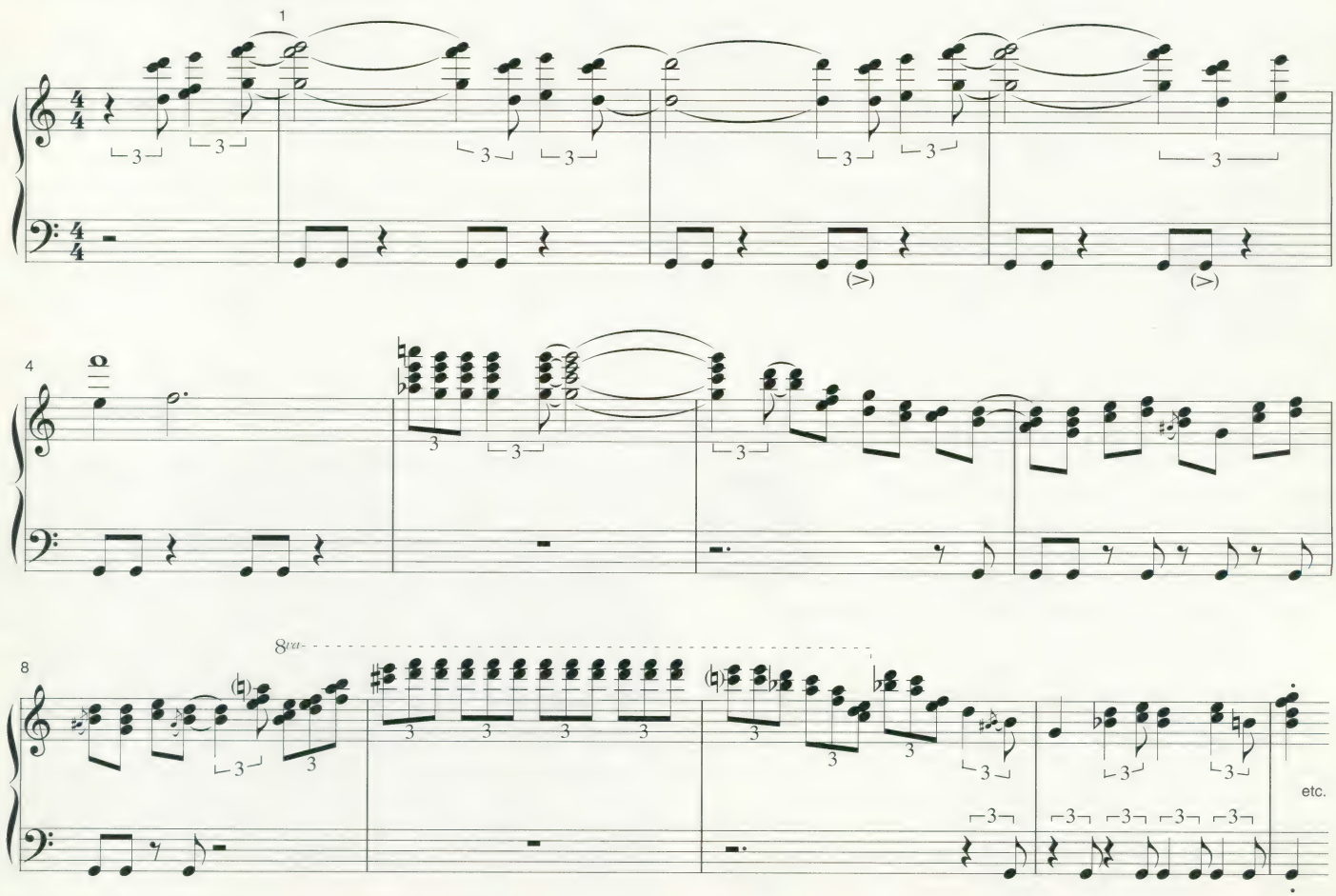
Robert L. Doerschuk flunked out of shop in high school. Seems he was too busy playing gigs to concentrate on doing anything constructive.

"GOOD GOLLY MISS MOLLY"



TRANSCRIPTION BY TOM DARTER

fundamental concentration on using the piano to suit their purposes as instrumentalists, these players were spiritual kin to their counterparts in classical music.

Little Richard changed all that. His contribution to performance *theory* was to introduce an element borrowed from religious musical tradition and apply it to secular performance. Not something as simple as gospel licks, though certainly they were a part of his pianistic vocabulary. More importantly, Richard introduced the concept of ecstasy to mainstream music, and in doing so ignited the bomb that splattered rock and roll across America's startled face.

Ecstasy, in Richard's performance, and eventually in performances by and audience response to rock artists in the decades to come, boils down to a surrender of control at some point. Generally, that point occurs where the player is overwhelmed by an insistent rhythm; his or her identity gets swept up, like a rock in a landslide, and the focus of performance transforms from being in control of an improvisation to absorbing oneself into and doing what must be done to further the momentum of the beat. (For another angle on this idea, see the July '92 column on differences between playing off of rock and jazz patterns.) Where this moment occurs is up to the artist and his or her band, though in general the idea is to hit the high point early and keep it going all the way through the encores.

Unfortunately, ecstasy, and the contingent loss of full control over improvisational nuances, often translates into performances that are, in cold musical terms, less than meticulous. With that in mind, the question that separates us into pre- and post-Little Richard camps is: Does it matter? Of course, it does. No one enjoys hitting wrong notes. But for those of us who came after Richard, who grew up listening to rock and roll bands that never quite mastered the art of tuning, or to bands that won fans by cockily not bothering to tune or even learn to play their instruments, attitude could be as important — at times *more* important — than proficiency itself.

This was the lesson taught to innocent kids by Little Richard. On all of his major records during his heyday in the '50s, his backup musicians played as tightly as the best swing ensembles. Check the rhythm on "Slippin' and Slidin'" or "Lucille": Nobody would play that propulsively and efficiently until drum machines and sequencers made near-perfection possible. The wild card on these records was Richard himself. With the band's mean riffs and Earl Palmer's dead-on drumming behind him, his borderline insane vocals and frenetic piano were free to break every convention at no risk to the groove.

Such was the case in "Good Golly Miss Molly," which Richard recorded in 1956. As on most early rock recordings, the rhythm section recycles a two-bar figure against nonstop backbeats. This repetition builds up enough energy to push him over the edge by the end of the third vocal verse; there, he signals the moment of ecstasy's arrival with a strangled banshee shriek, which segues neatly into a tenor sax solo.

Apparently, though, Richard was still in some control during the first verse, on which he played the piano solo transcribed here. Never the most accurate player, he was nonetheless capable of hammering out parts that reflected some concept of melodic shape. Glitches were numerous — so much so that they became a part of his expressive language as a pianist. Too often this sort of slop distracts from the fact that coherent ideas, and some intriguing cross-stylistic elements, characterize his playing as well.

For example, like Chuck Berry, Richard made use of the peculiar tension between straight and dotted rhythms that one often hears in early rock and roll. In our transcription, with the band laying down a beat on the I chord based on straight eighth-notes, Richard opens with a syncopated figure one might expect to fit more neatly in a jazzier context. Notice, though, that his left-hand part — what there is of it — is played without syncopation, in an alternating pattern of eighth-notes and quarter-note rests that anticipates reggae. Yet after dropping the left-hand part and playing some high-register triplets during the IV chord in bars five and six, Richard charges back into the I chord on bars seven and eight with a straight-eighths part that (a) locks onto the beat, thus kicking it harder, and (b) plays very effectively against a powerful off-beat pattern in the left hand. Ooh, my soul!

Gotta go. More rock next time.

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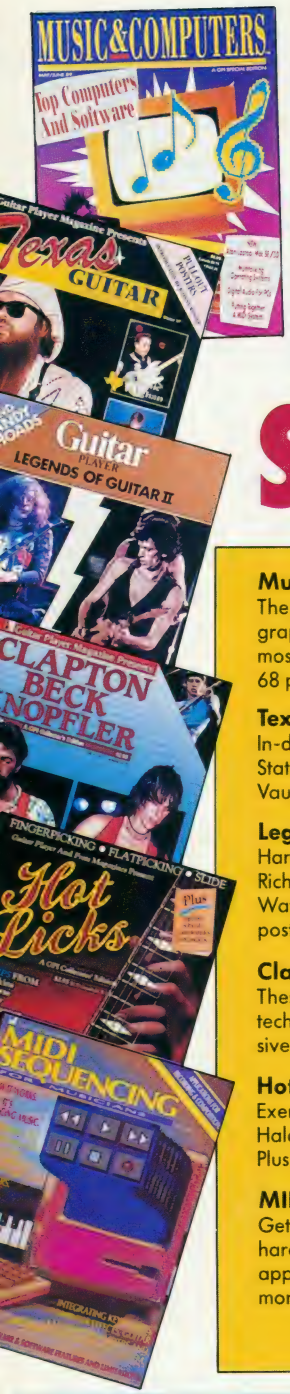

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INSIDE THE MUSIC

DAVE STEWART

SOLOING — THE FINAL FRONTIER
PART 1: SOUNDS & PROGRAMMING

I RECENTLY WATCHED A VIDEO OF some big mega-guitar concert in Seville (Spain) where the likes of Steve Vai, Joe Satriani, and Brian May were paraded out to do their flashy fretboard stuff. I have to admit, it was pretty exciting (though not exactly subtle). No one wasted any time developing themes or delivering vocals (apart from Joe, who briefly howled something about a fat old moon) — the universal format was to tear through a perfunctory 16-bar tune at the head of the song, then straight into the real point of the exercise, five or six minutes of no-nonsense, heads-down, ripped-trousers, amps-up, pedals-on, roaring, screaming, dive-bombing, face-pulling, testicles-swinging-in-the-wind *guitar solo*.

The physical rules of the game were quite interesting — when not running back and forth across the stage or leaning back-to-back with the bass player, all contestants adopted a menacing crouched pose, threw their heads back in agony when bending a note, and punched the air when playing an open string. Facial expressions were carefully orchestrated, too — a goofy sort of "shucks, aren't I brilliant" grin intensified to a grimace of horrified amusement whenever the hugely popular (and apparently obligatory) "tapping" technique was used, or gave way to a toddler's pout on the rare occasions when a long, low note was played. (You snatched my teddy, but now I'm getting my own back by playing this bottom *E* string at excessive volume.) Everyone had a wah-wah, and no one could use it without opening and shutting their mouths in time with the foot movements. If nothing else, a reminder that the goldfish needed feeding. . . .

I'm sorry to have strayed off the subject and started talking about fish so early in the article, but there's something about guitar solos that makes the mind wander. Stop me if I do it again. Anyway, standing sheepishly at the back of the stage looking embarrassed by all the theatricals and ducking to avoid the odd flying guitarist, were one or two sad-faced keyboard players, pressing keys but completely inaudible. I wondered if, like me, they wanted to be down in the front with Steve Vai doing a bit of howling and screaming, or whether they thought this sort of thing was beneath them. What do you think? Are we keyboardists doomed for all eternity to stand in shadow miserably playing silent pads while some blue-haired maniac does the whammy fandango out front? Are we too musically sophisticated for these vulgarities, or do we simply lack confidence in our own soloing? Whatever your feelings, it seems unfair that the plank-spankers get most of the lead breaks, so in the hope of alleviating this unacceptable situation, this and next month's articles are devoted to the psychology and practicalities of the keyboard solo — a subject close to my heart.

Some of you might think that playing a good solo is simply a matter of turning up loud and playing as fast as possible, but solos built on speed alone are likely to impress only other musicians, a small fraction of your potential audience. Other factors are more important, and the principal one of these is, in my opinion, choice of sound. In that department, ironically, we are lagging behind the guitarists, who have spent the last 30 years refining the noises an electric guitar can make by working on sound production, amplification, and signal processing. On the whole, keyboard players have been more conservative. Despite owning instruments that can make practically any sound, we have merely dabbled, sticking to tame factory presets when we could have been experimenting with wild new sounds. There are exceptions, but not enough of them! We need to be more determined to stamp our own identity on sounds if we want to achieve the instantly recognizable status of a Holdsworth or a Hendrix. Here are a few thoughts that might help.

ARE WE KEYBOARDISTS DOOMED FOR ALL ETERNITY TO STAND IN SHADOW MISERABLY PLAYING SILENT PADS WHILE SOME BLUE-HAIRED MANIAC DOES THE WHAMMY FANDANGO OUT FRONT?

(1) Choice of Instrument/Waveform. The marketplace is clogged with instruments old and new, good, bad, and indifferent. Thanks to sampling, the choice of waveforms is now infinite. A solo can be performed on a sample of your Aunt Mary's answerphone message (and probably has, by Jesus Jones or somebody). Anything is possible, from the historic wail of a cranked-up B-3 and Leslie to the roaring of sampled howler monkeys. Though some jazz purists will bypass the whole dilemma by opting for a straight piano sound and identifying themselves by nuances of phrasing, the rest of us face some tough decisions when it comes to choosing a keyboard sound. All I can say here is, be imaginative, and for God's sake *get your own sound*. Wading through piles of expensive factory cards and sample disks looking for something ready made is unlikely to be the answer. You should be prepared to learn how to program your instrument and, if necessary, do your own sampling to create your own unmistakable noise. Running a battered old Clavinet through some antique fuzz box and telephone speaker, recording it on cassette, then spending an hour or two sampling it into some low-cost 12-bit unit may not produce the most beautiful keyboard timbre ever heard, but it is far more likely to produce something original and interesting than rummaging through factory presets.

Some cautionary notes on the current market: It is generally assumed that because a new keyboard comes with so many waveforms, it is a good instrument. This is not necessarily so; the kind of corporate politics that dictate what goes into a modern keyboard generally favour quantity over quality, so you might be buying 300 buzzy digital waveforms, where what you really want are six sweet-sounding analogue ones. However, it's hard to generalize, and modern keyboards do have a lot to offer despite being produced in an atmosphere of increasing panic. If you're about to buy an instrument, be selective, demanding, and thorough, and make as many comparisons as you can. Once you've made a choice, be prepared to work with it for a long while to make it speak with your voice. Remember, finding your own sound is a lifetime's, rather than an afternoon's, work!

(2) Envelope Tweaking — Attack & Sustain. Many keyboard presets feature a strong per-

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Dave Stewart and Barbara Gaskin are recording artists for Rykodisc. You can contact Dave and Barbara via Broken Records, 18 Yeomen Way, Hainault, Ilford, Essex IG6 2RN, England.

INSIDE THE MUSIC

cussive attack, but relatively little sustain. These can be fine for rhythmic parts, but are not best suited to fluent lead playing — a legato run will be converted to a series of clunks and thumps. Try to identify which part of the sound is giving the strong attack, and reduce its output level (or increase its velocity sensitivity value — that way, quieter notes will have less attack, which sounds more natural). At the same time, increase the sustain part of the sound to a realistic level; there's nothing worse than standing there, head thrown back in proud profile, lit up by green lasers as the wind machine billows out your Lurex cape, holding a climactic high note which dies away after 1-1/2 seconds.

Occasionally, a sound will have too little attack — some woodwind and brass patches take too long to fade in, which makes accurate timing impossible. Rectify this by using the fastest attack rate in the amplitude section (usually called VCA, DCA, TVA, or some other hopeless jargon). If this doesn't work, do the same in the filter (VCF, DCF, TVF, ditto) department.

One or two keyboards I have encountered offer a nice facility where the start point of a sample can be modulated by the key velocity — so a marcato string sample would sound its loud, bowed attack only in response to louder notes. Softer key presses would cause the sample to be played from a later starting point, missing out the bowed portion and producing a quieter attack. Although this sounds over-technical, if programmed correctly it can be extremely effective, and I recommend it as a way of introducing more expression into lead sounds.

(3) Choice of Attack Sample. If you own a sampler, workstation, or sample-playback device like an E-mu Proteus, you will be able to utilize the popular technique of grafting a sampled attack — say a picked guitar string or marimba hit — onto a sustained or looped waveform. I would recommend the use of velocity switching (or cross-fading) to vary the attack sample itself, which will give either a variety of initial timbres similar to those produced by an acoustic instrument (if that's what you want), or a new, hybrid sound where a mandolin/flute combination turns into a santur/trumpet sound at higher volumes (something I might want!).

(4) Envelope Tweaking — Decay/Release. Less vital than attack, but worth a mention. For some reason, many factory patches have a bit of built-in decay at the end of the sound. This may be okay for legato chordal work, but will spoil the clarity of a fast run. If you intend to play fast (what do I mean, "if"?), use little or no decay/release.

(5) Keyboard Scaling, Filtering, Digital EQ. A problem with electronic keyboards in general is that they can sound too harsh and piercing. This is particularly true of digital waveforms and samples, though the old analogue machines can get a bit fierce at the top end, too (not to mention out of tune). By sensible use

of keyboard scaling, we can now hold back the level of the top notes so they don't scream out too much, and harsh overtones can be removed with the filter, or sometimes by digital EQ. Bear this in mind the next time you notice the rest of your band staggering about clutching their ears during your keyboard solo.

(6) Sound Processing — Vibrato, Chorus, Reverb, Etc. Even after undergoing the cosmetic sonic surgery mentioned in (5), some waveforms (notably digital woodwind-type sounds) just shriek out whatever you do to them. A little built-in vibrato will counteract the tendency to blare. Although the vibrato does not affect the tone (only the pitch and/or amplitude), it introduces a little mobility into the sound, making it easier on the ear. I usually program it to come in after 1/2 second or so. Subtly now — clarinets and police sirens make uneasy bedfellows!

Space does not permit a detailed examination of all the digital effects now crammed into workstations like the Korg 01/W, but suffice it to say they sound very good, and can turn a paltry keyboard patch into something quite acceptable. If your keyboard does not have internal effects, you'd be well advised to look into getting at least a chorus pedal or delay unit to enhance its sound. Most modern keyboard sounds are stereo; if your patches sound a little thin, prosaic, or boringly mono, some nice stereo chorusing and reverb (to name but two effects) will liven them up no end.

(7) Distortion. Having spent many long, agonized hours weeping with boredom while laboriously following the tips in (1) through (6), ruin the whole effect — but get something new — by introducing distortion. It is quite horrifying how all keyboard patches sound the same when run through a fuzz box or workstation distortion/overdrive effects. Once the circuitry has kicked in, it doesn't much matter whether you started out with a brass, piano, strings, or guitar patch! However, controlled (or uncontrolled) distortion is a great way of adding toughness and excitement to a sound, and is another way of smoothing out waveforms which otherwise might sound too harsh. I would recommend some serious experimentation with both internal distortion (if your keyboard has it) and distortion pedals. The latter are available in a vast number of shapes and sizes, of which your local music shop probably has at least four kinds. These things are aimed at the guitar market, so try borrowing a pedal from a guitarist friend to see which one suits your keyboards. Expect some difficulties — taking a D.I. [direct-input] feed from such a pedal will often result in a thin, buzzy sound, so you will have to adjust the pedal's tone controls, or even use an amp and speaker to get a full, fat tone. Inconvenient, expensive, but something that may be necessary if you want that ultimate lead sound. (Remember, the much-copied English guitar genius Allan Holdsworth even resorted to rebuilding his Marshall amplifiers early on to make them produce the tone he wanted; getting a great sound doesn't come easy.) Having tried many distortion pedals myself, I've now settled on two boxes which suit two of my older keyboards. One of them gives a simulated "feedback" effect which is useless in itself, but modulates nicely with ensuing notes. The use of stereo chorusing, delay, and sometimes compression smooths the whole thing out nicely. Fortunately, I don't have to use an amp and speakers to get the best out of these pedals (saves a fortune in osteopath's bills), but it took a few years to find the right ones! No point in listing the makes, as they wouldn't sound right with your keyboard patches anyway.

Enough, I think, about sound. Next month, the real business of what to play.

P.S. Many thanks to readers Andy Hinz, Larry Deming, and James Garfield, who submitted some particularly despicable specimens — alas, too late to get among the prizes — in our fabulous "Horrible Chord Competition." All entries sounded as though they were composed by the time-honoured method of sitting heavily on the piano keyboard, though Andy obviously shifted a few times before settling, and has thinner buttocks than Larry. James, though — choosing an easy target in the repellent and rightly hated dominant seventh chord — added an obnoxious twist by superimposing two of them in different keys, both slightly detuned to add an even more foul and unpleasant flavour. Blooarrgh! To each of these intrepid pioneers of dissonance, a consolation prize of one yellow-and-mauve brushed-nylon legwarmer (attractively styled with embossed lime-green plastic bullfrog motif), and I have forwarded their entries to the A&R departments of several leading American record companies.

POWER SEQUENCING

CRAIG ANDERTON

SIGNAL PROCESSING WITH SEQUENCERS

IN TODAY'S MULTI-TIMBRAL SYNTH WORLD, IT SEEMS THERE are never quite enough synth outputs — let alone signal processors — for the average mix. However, your sequencer can provide many signal processing effects by tickling your sound generators in particular ways. There are a few tradeoffs; some of the following techniques involve synergistic operation between sequencer and synthesizer, and some techniques use up more voices than non-processed parts. But there are advantages as well: Sequencers can give effects you can't get with outboard units. Let's start with some of those.

• *Synchro-sonic tremolo.* "Synchro-sonic" is a term I use to describe the process of imparting rhythmic characteristics to a sound that normally doesn't have such characteristics. A simple example is using a noise gate triggered by a kick drum to gate a bass sound on and off, thus synching it to the kick.

Tremolo has fallen out of favor in recent years compared to the halcyon days of tremoloed surf music and Bo Diddley beats, but this effect can help make a synth sound less static, especially if the tremolo effect is synchronized to a tune's rhythm. Unlike conventional tremolo boxes, sequencer-generated tremolo is easy to synchronize to the beat.

To add tremolo, simply draw the desired modulation waveform and apply it as a continuous controller that affects a signal's master volume (Figure 1, bar 1). Usually controller 7 is used for this, although you may want to dedicate a different controller to tremolo and route it to a DCA that affects the signal path. This way, you can continue to use controller 7 for overall volume.

Fig. 1. Five bars of modulation "waveforms." Bars 1 and 3 show the full eighth-note waveform; bar 2, the waveform scaled for a fade-in; bar 4, scaled by percentage; bar 5, thinned to conserve memory.

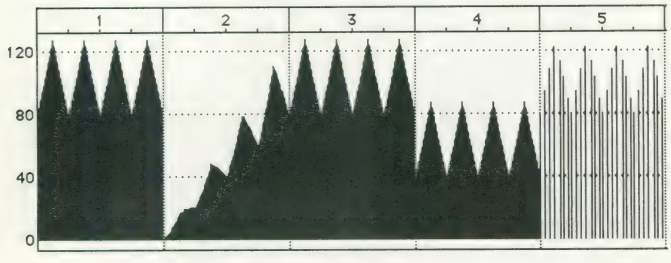
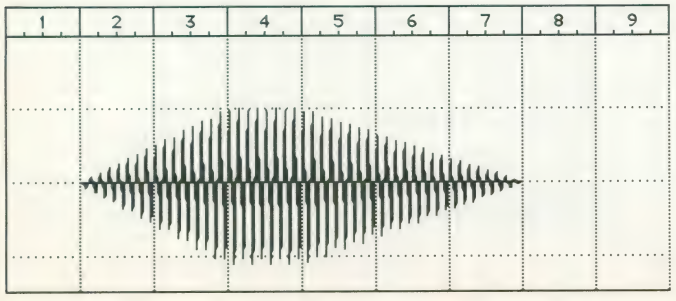


Fig. 2. An eighth-note waveform comprised of pitch-bend messages can be used for precisely controlled vibrato.



If you come up with any particularly useful modulation waveforms, save them in a separate sequence that serves as a "waveform library." When you need that waveform again, just copy it and merge the desired waveform into the track to be processed. Ramps, for example, work very well.

A few other tips: To fade in or fade out tremolo effects, use the sequencer's "change smoothly by percentage" command (Figure 1 — bar 2 fades into bar 3). Define the fade-in start point (zero volume) and end point, then smooth from 1% to 100%. Do the reverse for fadeouts.

To offset the tremolo waveform, add a constant to all values (Figure 1, bar 4, shows the same waveform as bar 1 with a value of 40 subtracted). Finally, note that you can often thin the controller stream to an almost absurd degree (Figure 1, bar 5) without noticing much sonic difference — the human ear is far more sensitive to pitch variations than to level variations. So tremolo effects need not take up too much sequence memory.

• *Synchro-sonic vibrato.* Sure, you can just use the mod wheel to add vibrato, but it probably won't sync to the music. However, you can use pitch-bend messages to control vibrato the same way we added tremolo. Since this signal will be centered around zero, changing smoothly by a percentage brings in the vibrato effect without offsetting the pitch center. (Figure 2 shows an "eighth-note" waveform fading in from bar 2, beat 1 to bar 4, beat 1; the fadeout starts at bar 5.) Vibrato with a period of an eighth-note, eighth-note triplet, or sixteenth-note seems to work best.

Waveform libraries are also handy for vibrato, but find a MIDI guitarist who can give you some good finger vibrato patterns. They're just what the doctor ordered for synthesized lead parts.

Note that you will not be able to thin the data as much as you can the tremolo without the vibrato sounding grainy.

• *Cool drum flanging.* I've never been a big fan of the randomize/humanize functions found on sequencers — at least for their intended application. (Good musicians don't make random timing changes — unless they've had too many beers or aren't very technically proficient. Rather, they lead or lag the beat in a conscious or intuitive way.) But randomization can work great for flanging drum parts, even though the process uses up twice as many drum voices.

Copy the drum part (or just the drums you want flanged) to a separate track, then randomize the copy track within about a 15ms window. At 480 ppq, this works out to about ±8 clocks. Assign both tracks to the same channel, and *voilá* — instant flanged drums. This works for keyboard parts too.

• *Cool drum panning.* Here's a tip for those who like to use samplers as drum sound generators. Assign the same sound to two different notes, but set different pan positions — for example, center and left of center. At the sequencer, use a change filter or logical edit filter to cut, for example, just the second and fourth beats of every measure driving one of the drum sounds. Paste this into another track, then transpose it to the pitch of the other drum sound. As the part plays, the percussion sound will bounce over to one side periodically.

Musically, I find this works best on short percussion sounds, such as claves, tambourine hits, claps, etc. Moving primary drums like the kick, snare, or toms can be disorienting.

• • • •

Out of space already? Gee, time does fly in the studio. See you next time with some time-twisting signal processing techniques.

Craig Anderton is so deeply involved with MIDI sequencing that he's actually trying to devise an interface that would allow him to generate MIDI clocks from his heartbeat.

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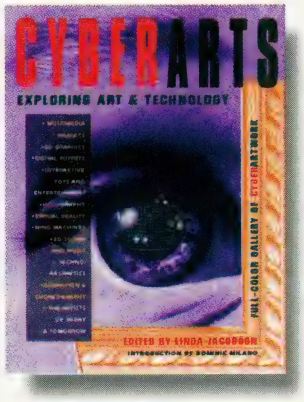

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SONGWRITING

JESSE HARMS

MOONING & SPOONING IN JUNE

"HOP ABOARD A BUTTERFLY/WATCH your troubles flutter by." By today's standards, those lyrics sound awfully corny. But if you think about it, writing them required a stroke of genius. Not only do they contain a great play on words, but they convey the essence of the light-hearted, carefree mood the lyricist was trying to get across. And the listening public liked what they heard; popular music and lyrics have always reflected what society at large was thinking and feeling. But times change, and in the '60s, as more and more artists started to write their own songs, lyrics began to focus on the writers' personal feelings. In that long-ago decade, popular music gave us glimpses into the love life of Joni Mitchell, the sex lives of the Rolling Stones, the mystical experiences of the Beatles, and the drug experiences of just about everyone else. These days, though we still hear lyrics as trite as ever (virtually any Top-40/dance song), we also have lyrics that depict the deepest ills of our society (practically anything by Public Enemy).

Yet despite changes in style and substance, a good lyric has always been one that gets the listeners to identify with your story — whether it be a total flight of fancy or a dark look at a gritty, unpleasant reality. If at the end of the song your listeners haven't felt what you wanted them to feel, or they haven't seen the story from your point of view, then the lyric still needs work.

A well-written lyric will take listeners to somewhere they've never been before and make them say, "So *that's* what it's like." Or it will tread on familiar ground and cause them to react with, "I've felt that way too." Jimi Hendrix was a master of fantasy lyrics. Think back to just about any one of his songs; it was a magical trip to the unknown. I'm sure only Jimi visited a place where, "It takes an hour and a day to get there/if you travel by dragonfly." Conversely, the Tori Amos song "Silent All These Years" focuses on the all-too-common reality of being caught in an abusive relationship. She paints a stark, yet vivid picture of the situation using a combination of small, ordinary events and fanciful imagery. The plaintive opening line, "Excuse me, but can I be you for a while?" sets the stage for the story, which covers emotions ranging from despair to anger to determined self-release. Her imagery is both dark and uplifting, but always to the point — the telling of the story. To that end, Tori uses the song structure expertly; the uplifting and positive chorus ("I hear my voice and it's here") balances the dark verses ("I got the anti-Christ in the kitchen yellin' at me again"); the lyric becomes more assertive in the bridge while the music expands harmonically until the theme of inner strength reaches full resolve in the final verse ("It's your turn now to stand where I stand"). And all the while, the listener never loses the mood — even if he or she can't directly interpret the lyrics. Case in point: I don't know exactly what those "orange clouds raining in [her] head" are, but I also don't think I really care. When Tori sings the line, the *feeling* of what she means comes across, and that's the bottom line. Creating a mood through the use of "poetic" words is just as valid a lyric-writing technique as telling the story in a literal manner. Maybe the next time I listen, the exact meaning of Tori's orange clouds will become clear. Then again, maybe it won't. The point is, the words create an emotional reaction in me, and that's what matters.

• • • •

IF AT THE END OF THE SONG YOUR LISTENERS HAVEN'T FELT WHAT YOU WANTED THEM TO FEEL, THEN THE LYRIC STILL NEEDS WORK.

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I've always been attracted to words that have a musical or rhythmic ring to them. Many catchy-sounding lyrics create their musical effect through the use of alliteration. Some prime examples: "Tea for Two," "Walk on Water," "Lay Lady Lay," and the hands-down winner, "Boogie Woogie Bugle Boy of Company B." These phrases practically sing themselves.

Standard creative writing techniques are easily applied to lyric writing. Pop song lyrics have always made extensive use of metaphors ("Life is a Highway," "You Are the Sunshine of My Life"), similes ("Fly Like an Eagle"), hyperbole ("Sitting on Top of the World," "Cry Me a River"), and double entendre ("Hold On, I'm Comin'," "Drive My Car"). That last one is especially popular. Quick: Think of a rock song that isn't full of double entendres. Sex sells — even (or perhaps especially) in songwriting.

Although you should generally avoid using clichés like the plague (ha!), another popular technique — especially prevalent in country music — is to take a cliché and give it a twist. This has the effect of leading the listener into familiar territory, which makes them feel comfortable with the lyric, then causing a reaction — oftentimes a laugh — when the twist comes. Typical of a twisted cliché: Garth Brooks' "I've Got Friends in Low Places." Puns are also popular in country music. My favorite: "She Got the Mine, I Got the Shaft."

Sometimes you can get your message across effectively through the use of opposites — either direct or implied. The direct approach: Wynonna Judd's "My Strongest Weakness." An implied opposite comes in Kenny Rogers' classic "The Gambler" when he sings, "know when to walk away/know when to run." The listener's ears are expecting the second line to be the opposite of "walk away," perhaps "stay"; instead they're thrown an ear-opening curve.

While we're speaking of words that are implied, when you're telling a story, try to think of indirect ways to state a literal idea. For example, in the Wynonna Judd hit "His Only Need," the literal idea of a woman's advanced pregnancy is written as "couldn't tie her apron," and two people growing old together is related as "Billy watchin' Bonnie's hair turn gray." Considerably more lyrical than "she got huge" and "they got old."

Slang has always been a large part of pop music, but I think it's wise to avoid words that have the potential to become dated. For example, the phrase "sock it to me" worked in Aretha Franklin's "Respect" when the song was first released, but it sounds pretty silly today. And Paul Simon has publicly stated that he's less than thrilled with the lyrics to his "59th Street Bridge Song," which contain the phrase "feelin' groovy." (Can you blame him?) Only time will tell how rap music, which is filled with slang, will hold up over the long haul. (I can hardly wait for a rap oldies station.)

Even with all these lyrical possibilities, people still write songs that have what I call "cop-out" lyrics. No matter how great the rest of your song is, it only takes one line like, "I'm down on my knees/begging you, baby, please," to cheapen the whole story.

Jesse Harms is a Los Angeles-based songwriter and keyboardist. He has written songs for Heart, Eddie Money, and REO Speedwagon, among others, and played keyboards for numerous artists, including John Hiatt, Ry Cooder, and Sammy Hagar.

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REEL WORLD NOTEBOOK

JEFF RONA

CLIENT: DAVID MICHAEL FRANK
PROJECT: *POISON IVY* (PART 3)

I'VE DESCRIBED THE DIFFICULT road that was traveled just in order to get to the first note of the film score to *Poison Ivy*. Now we finally get to play a little music. The score was a blend of orchestra and synths, with the orchestra already recorded before we undertook our job.

Gathered in my small home studio were the composer, his engineer, an electronic drummer (no, the drummer wasn't electronic, but the drum set was), at times a MIDIed bass player (the bass, not the player), and myself — all crammed into one small room with all my synths, computer, mixer, and other audio gear. There was barely room to turn around. Garlic and Mexican food were outlawed. We rented a 4-track analog recorder with Dolby SR on which to record the music. One thing about all this electronic stuff: It puts out enough heat to run a steam turbine. Air conditioning can be one of the best investments you can make on a small home studio.

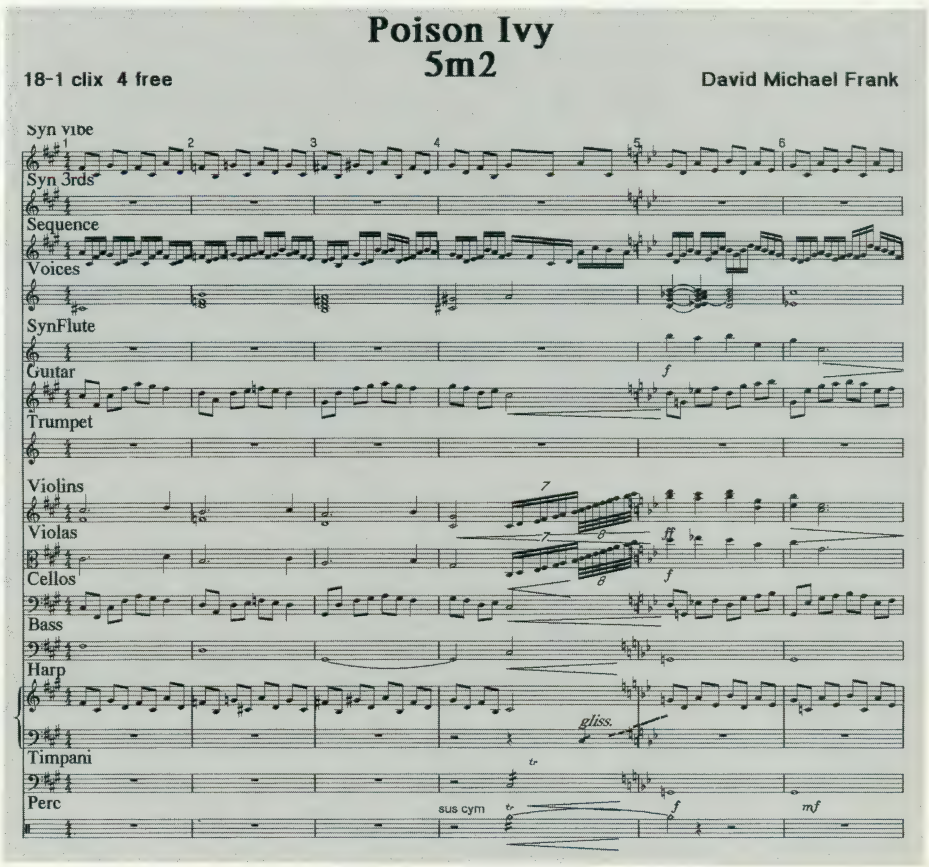
David, the composer, brought disks of the sequences he did at home while writing, which I converted from the Atari to my Mac, thus making it easier for me to edit and flesh out the parts as needed. No matter how carefully the music is sequenced, there are almost always changes to be made once new sounds are created and listened to while watching the picture.

David wrote for a very specific set of sounds, or at least ideas for sounds — none of them actually existed prior to the recording. Now I had to spring into action and design the sounds he wanted. We were already far behind, so, as usual, there wasn't nearly enough time in which to do it. The synths were recorded "virtual" — that is, going straight to the final three-channel recording (left, center, and right in the movie theater) with no multitrack in between. With multiple parts being recorded together, there was little or no opportunity to stack synths for bigger sounds. Most parts had to be played by one or two synths at the most. That meant that each sound had to count. Most of the sounds I found in my library needed to be tweaked to some degree to make David happy. I've learned that when composers say, "I'm not sure what I want here," what they really mean is, "I know exactly what I *don't* want here."

Each sound was scrutinized, picked apart, and either edited or abandoned. I keep most of my sounds in a librarian on my computer organized by type (bells, voices, brass, FX, winds, bass, and so on), so auditioning sounds goes quite fast. Looking for the right sample takes a bit more time, since they must be loaded from disk and set up in the sampler. It means thinking fast and going for just those sounds that I really believe will work, but I always leave some room for a few experiments. As I go through sounds, I'll pull a few out that might seem wild and inappropriate at first, but occasionally lead to an interesting juxtaposition within the timbral palette. (How about some slowed-down sampled crickets to go with that clarinet?)

We listened to each part with the appropriate sequence and the orchestra tape, to hear the blend. Sounds that seem very good by themselves can take on a totally different personality when blended with other electronic and acoustic sounds, which is the heart of what is called *orchestration*. Each sound has a place in the overall sonic palette. Timbres affect and influence each other when blended. It's important to keep an open ear, and listen very carefully to how sounds mix with each other as they are added together. A simple sound can work very well in a piece of music where a big, lush, stacked sound may not. It's not only big versus small, but every aspect of the sound — attacks

The beginning of one of David Michael Frank's cues for Poison Ivy. *This printout was generated on a Hewlett Packard DeskWriter directly from C-Lab Notator running on an Atari ST.*



Jeff Rona is a composer, synthesist, writer, and educator in Los Angeles. He was chairman of the MMA for five years, and is currently coordinator of the UCLA Extension electronic music program.

that match or complement, harmonic structures that don't end up turning everything into stale organ sounds (or sonic mush).

As I mentioned, the score was written with a specific palette of synth sounds in mind to go along with the orchestra. The example shown here, output directly from C-Lab Notator on the Atari, doesn't show the entire orchestra or all of the basic synth sounds in the score. No single cue used everything, which made things a bit easier on me. Some sounds, like the sampled guitar, were just a matter of choosing one from my library of samples. Others, like the ones called "Hi Melody" and "Low Melody" had to be created from scratch. Those were generally very melodic, so I looked for sounds that were reminiscent of a woodwind instrument without being too exact. I made a blend using the Korg M1, which has a number of very good woodwind sounds in it, and an old Yamaha TX7 panpipe patch (which sounds horrible by itself). A part called "Keyboard Arpeggio" needed to cut through the orchestra without being cranked up in the mix. I put together a Roland JD-800 patch that uses the MIDI Clav waveform twice (detuned slightly), with Piano Attack and Org Vox for some body and release. I used a somewhat ethereal "Fairlight-like" sample for the voices, blending a multisampled voice patch with a single-sample voice patch for an interesting hybrid that didn't sound too real.

There's a lovely Korg WaveStation A/D sound (called Vel. Drum Vocoder) that worked nicely to replace a pad part used during a rather seductive scene. Using the WaveStation's cool wave sequencing capabilities locked to MIDI sync from the sequencer, the patch uses its vocoder algorithm to produce a haunting imitation of a filter with sample and hold, but with more nuance. By simply playing the chords of the pad (which need to be strictly quantized and shifted ahead a few clock ticks in order for the wave sequencing effect to work), we produced a pulsating chordal rhythm that worked very well.

There was a synth part, called "Syn Vibes" in the score, that was used throughout to double the harp in the orchestra. Since the real harpist played very loosely, rhythmically speaking, it was important to avoid any sound with a strong attack, since it would just point out the rhythmic problems. My choice was to go with a very simple sound that had a slow attack, a fairly long decay, and vibrato, something a real harp can't do. The resulting hybrid instrument gave an eerie sheen to the harp, without being very present in the mix.

The process for recording the *Poison Ivy* score, after I put together the sound palette, was first to load up a sequence and set the sounds for the instruments. As needed, I tweaked either the notes or the synths to match David's sequenced performance to the final sounds (to compensate for his not hearing the sounds as he played), often modifying velocities and durations. Once we got everything together, the engineer mixed it while checking it against the recording of the orchestra already on tape. We also listened to picture to be sure the impact was right and that the music was neither swallowed up nor overpowered by the action. Our engineer then recorded it, and we moved on to the next cue. In all, there were over twenty cues to get through.

Cues were recorded in an order that kept the most similar themes together. This made for less reprogramming and mixing and helped save time. There is no reason to record the cues by their order in the film, since everything gets re-transferred and re-edited by the music editor later. I think it's good to do the hard ones first, since by the time you're near the end, you probably haven't slept much and are in no mood to tackle the big pieces on the list.

Once we got a pace established, things went smoothly, and we picked up speed as we went along. We finished in time. David brought in the MIDIed bass player and drummer to get more of a live feel on some of the cues, but we used them far less than planned, since we had gotten so far behind in the first few days. This gave me the chance to do some drum and percussion programming myself, which was a treat after the days of SMPTE hell and sound design (hey, that sounds like a name for a hi-tech country song!).

The recording wound up nicely, everybody packed up and left, all the extra equipment was returned, and I cleaned up my studio. However, upon inspection, I found most of the contents of my refrigerator were gone — one of the drawbacks to working at home with other people. Next time we'll order out.

PEAVEY DPM C8

MIDI MASTER KEYBOARD

By Jim Aikin

NO DOUBT ABOUT IT — PEAVEY designed the DPM C8 to get noticed. The bright red lacquered wood-grain finish jumps out at you from across the room. Tiptoe closer and you'll find an 88-note weighted keyboard that feels great. And hmm, what's this? A disk drive. About time somebody put a disk drive in a master keyboard.

Then you notice the price tag. Must be a misprint. They couldn't possibly sell an 88-key controller for a mere $1,999 list. Could they?

It's not a misprint. And it's not the end of the list of mouth-watering features, not by a long shot. Shall we talk about eight overlapping keyboard zones? Not one but two merging MIDI inputs? Remote control of a sequencer? The sys-ex bulk dump buffer? This is one killer board. At 82 lbs, it's also on the hefty side. Don't plan on tucking it under one arm unless you're a lineman for the Rams.

Lest this appear to be an unqualified rave-up, we did find a few places where we felt features could have been added to the C8 to improve its usefulness. We also uncovered several bugs in the operating system. Since we were reviewing one of the first units to roll off the assembly line, we were able to alert Peavey to these problems, and they rushed us an updated ROM in which the bugs had been nuked. We're told that all of the units shipped to stores will have the updated operating system — so while it's still possible that you might run into a bug or two that we missed, we're not going to bore you with the details of the ones we spotted.

Overview. The physical layout of the C8 is quite impressive, starting with not two but three wheels (programmable) at the left end of the keyboard. The pitch wheel is a full 3" from the left edge of the case, which is above average (a Korg Wavestation measures only 1-3/4" here and an Ensoniq SD-1 only 2-4/8") but not too far to reach comfortably while resting your fingers against the side panel, unless you have small hands. As seems to be standard on master keyboards, there are four programmable sliders, each with a programmable button beneath it. If you play a lot of left-hand keyboard parts, you may appreciate the fact that the sliders are mounted two on each side of the panel, so that a pair of them are bound to be in easy reach no matter which hand you have free. Also much appreciated: The rear-panel jacks are labelled along the top edge of the front panel, so you can see what you're plugging in without hauling out the dentist's mirror. (You do carry a dentist's mirror in your gig bag, don't you?)

Each of the 64 presets can have up to eight zones (which Peavey calls ranges). Zones can be freely overlapped and given velocity limits. What's extremely cool is that in performance you can mute or unmute any zone at any time. Well, any time both hands are free; you have to press two buttons at once, and they're too far apart to cover with one hand. Being able to change zones in performance means that you can store two or three different layouts in a single preset, bring in extra layers, and so on. There's also a solo switch, which toggles back and forth between a single zone and your previous group of zones.

In some situations, switching presets rather than muting zones might be preferable: You can call up a new preset with one hand — and if you've set your global options and programmed the new preset properly, the C8 will let you sustain a chord while it switches presets. This is a dead cool feature if you've got to make some complex musical moves. You do have to know what you're doing, however: User error can cause stuck notes. The global option that you switch off is one that sends all-notes-off commands for all eight zones each time you leave a preset. And if you enter a new preset while holding down a chord, the note-offs for the notes in the chord will be transmitted on whatever channel(s) and output(s) are active in the new preset. So if you're playing a chord on channel 2 and switch to a preset that transmits only on channels 3 through 10, those notes on channel 2 won't get switched off. Bottom line: If you need this rather obscure capability, it's there. If you don't, leave the global all-notes-off switch turned on and don't worry about it.

Just for fun, we switched all eight zones on, assigned them all to all four MIDI outputs, and performed the Michael Marans Memorial MIDI Buttocks Test (playing thick chords with, ah . . . both hands). There was some fast arpeggiation in the chords, which is inevitable because we were maxing out the MIDI bandwidth — but the C8 didn't choke. When we played two or three notes at a time with this mondo preset, we could detect no slowing of transmission: The keyboard still felt very responsive.

Zones. The eight keyboard zones transmit one note per key, on a single MIDI channel,

PEAVEY DPM C8

Description: MIDI master keyboard controller.
Keyboard: 88-note hammer action, *A* to *C*. Velocity, release velocity, channel pressure sensing.
Other Performance Features: Three programmable wheels, one spring-loaded with center detent. Four sliders, four buttons (all programmable). Four footswitches (two programmable), two programmable CV pedal inputs.
Memory: 64 presets. 128K sys-ex buffer.
Features: Eight overlappable keyboard zones programmable for MIDI channel, output busses, transpose, initial volume, initial program change and bank select, velocity curve, velocity range, velocity offset, velocity scaling, and on/off for each hardware controller. Zones can be muted and unmuted in performance. MIDI input merging with rechannelization, transposition, data filtering, choice of output, and processing via the currently active zones. Transmits MIDI clocks and start/stop/continue messages with controllable and programmable tempo. Multiple sys-ex dumps can be stored in battery-backed RAM and saved to disk. Accepts program changes for remote switching of presets. Footswitch-stepped preset chaining. MIDI data monitor. Microsoft mouse or trackball can be used for programming. Switchable footswitch polarity. Copy utilities. Available in red or black finish.
Interfacing: Two MIDI ins, four MIDI outs. Two tip-ring-sleeve footswitch ins, two CV pedal ins (both 1/4"). Nine-pin connector for trackball or mouse.
Dimensions: 57" x 18" x 7". 82 lbs.
Suggested Retail Price: $1,999.99.
Contact: Peavey Electronics, 711 A St., Meridian, MS 39302. (601) 483-5365. Fax (601) 484-4278.

With 88 keys and a hammer action, the Peavey DPM C8 is no lightweight.

but each zone can transmit on any combination of the four output jacks. Zones can be transposed up or down by as much as four octaves, which lets you lay out several patches across the 88 keys and have them all play in musically useful ranges.

Each zone can be given its own velocity curve, scaling, active range, and offset. The 17 curves are preset in ROM, but a variety of useful options are included — concave, convex, linear, and flattened in the middle. With generous scaling from 0% to 200% and an offset of ±100, you should be able to get just about any type of response you need, except velocity crossfades. The C8 won't do them.

Each zone can transmit an initial volume level, a program number, and a bank select number of your choice when a preset is called up. These transmissions can also be disabled for any zone, which is essential.

Each zone has an Enables page, in which you can switch on or off the pitch wheel, wheels 2 and 3, the pressure sensor, all four sliders, two footswitches, and the two CV pedal inputs. This seems fairly sensible. If a zone is muted on the Play page, the controller data won't be transmitted, which is desirable to keep the MIDI data stream from getting clogged up. In order to fool the controllers into driving an effects processor, you'll need to unmute a zone on an appropriate channel and perhaps park its key range up at the top end of the keyboard. The Enables page, by the way, was where we ran into the only major bug in our tests. The C8 kept switching off all of its controllers, no matter how often we switched them back on and saved the preset. In the final operating system, this malfunction has been fixed.

Wheels, Sliders, & Buttons. While this area of the C8 is pretty well put together, we feel there's room for improvement. First item on our checklist: Is the polarity reversible on the footswitch inputs? Yes. Second item: Are the wheels assignable to any controller? Yes. In fact, the throw of the wheels, sliders, and pressure sensor can be reversed, so that the pitch wheel will bend up instead of down, and so on.

Oh, and lest we forget — the pitch wheel has better resolution than most tone modules are capable of responding to. When we pushed it as slowly as we could, it sent two or even three different LSB (least significant byte) values for each MSB (most significant byte). Most synths these days just throw away the LSB, so the C8 is definitely ready for the 21st Century.

The wheels can be assigned to any continuous controller between 1 and 120, or to channel pressure. Wheels 1 and 3 can also be assigned to pitch-bend, but for some reason you can't assign bend up or bend down to pressure. Wheel 3 on our test unit suffered a glitch in the lower part of its travel, which caused the output value to bobble.

The four sliders, regrettably, can *only* be assigned to continuous controllers 1 through 120 — not to pressure, poly pressure, or pitch-bend. Likewise the CV pedals. Also missing: The ability to scale the sliders' and pedals' output, for example so a slider will output volume values only between 72 at the bottom of its travel and 121 at the top. You can't reverse the operation of a controller as applied to a single zone, so a single slider can't be used for crossfades between zones. The good news is that in edit mode, the slider of your choice can perform data entry.

The choices for buttons include controllers 1 through 119 and three other options, each of which can operate in momentary mode (only while the button is pressed) or toggle mode (one press causes the button to act, a second press stops its action). Pressing the button sends a value of 127 for the controller, and releasing it sends a value of zero. An error in the manual alleges that a button can mute all MIDI outputs, which is something you would probably never need it to do. In fact, this option mutes the button's associated slider on all MIDI outputs, thus allowing you to mute the slider, move it to a new position, and then unmute it to send its current physical position. This might be useful once in a while, though we wish there was some indication in the LCD when a slider is muted. The other button options cause the data being transmitted by the associated slider to switch between its current value and its maximum or minimum value. This is handy for toggling between two volume levels, for example.

The big thing that the buttons won't do: They won't transmit program changes. The only time the C8 will transmit program changes is when you call up a new preset, which is unfortunate, as there might be times when you want to call up a new patch on a module without changing presets. Another thing we'd like to see added: If you assign a button to transmit a continuous controller message, it would be nice to be able to set the lower and higher values that it will send, and to

PROS & CONS

Pros: Eight keyboard zones, external sequencer control, MIDI input merging, great keyboard action.

Cons: Programmable buttons can't send program changes. No velocity crossfading.

set it to either momentary or toggle operation.

The C8 has two footswitch input jacks, one labelled Footswitch 1 & 2, the other Footswitch 3 & 4. The operating system, however, only lets you define two footswitches. The third and fourth are for incrementing and decrementing — either parameter values or, in play mode, through the presets or preset chains. We think it's too bad the first two footswitches won't perform other types of operations besides transmitting MIDI controllers 1 through 119. It would be nice if they could toggle specific zones on and off, for example, or send sequence start and stop commands. (The latter can only be done from the front panel in a special mode.)

Input Merging. Merging from input to output can be individually switched on for the C8's two MIDI inputs, so you can have your guitar controller and percussion pads active at the same time. Better still, for each input you can select any combination of outputs, transpose and rechannelize, and pass or filter various data types, including system real-time (clocks, etc.). Another switch lets you pass the merging input through the currently active keyboard zones. This is extremely cool; if you've strapped on a remote keyboard, the C8 has all the smarts necessary to handle splits and layers for you. All you have to do is send it a program change from the remote.

When we first switched on the C8, the merge feature started doing some very peculiar things — rechannelizing improperly, ignoring zones, filtering pitch-bend even though we asked it not to, and so on. After we reinitialized the unit (using the simple method given in the manual), the problems disappeared.

Sequencer Control. For each preset, you can store a song select message and a tempo. You can also choose which port(s) to send MIDI clocks and start/stop/continue messages out of, and whether to send the clocks always or only during playback. Probably the latter could just as easily be a global option, since few of us will be running both types of sequencers in any one session.

Starting and stopping the external sequencer requires hitting an extra button to enter the sequence page; when you're ready to call up a new preset, you have to hit the exit button to leave the page. This is perhaps not ideal in the busy environment of a performance. Since one of the soft buttons beneath the LCD is not used on the play page, we'd like to see the start/stop button placed here. Footswitch start/stop would also be a nice addition. While you're in the sequence page, one of the sliders turns into a data entry slider, and this can be used for adjusting the tempo. An indicator in the LCD blinks with every quarter-note.

Operating System. For the most part, the operating system is laid out in a very sensible way, with the soft buttons under the LCD taking you off to different pages. In most areas (velocity, controller switches, etc.), each zone has a whole screen full of parameters to itself, and most people will probably use the "RangeStep" soft button while programming to move from one zone to the next. The RangeStep button is usually the leftmost one; but for some reason, in the Enables screen it was the second button. This drove us absolutely nuts, but we're told that Peavey has changed the software so that in the release units it will be placed consistently.

The copy utilities are first-class. You can copy not only a whole preset but also a single range within a preset, or the controller settings for a preset, or all of the range settings without the controller settings. While you can't save a single preset to disk, you can save all 64 and later load a single one from that set. (On our test unit, a bug in this feature prevented us from leaving the Disk page after loading a single preset. We had to switch the C8 off and back on. When we did this, fortunately, we found that the preset had been loaded into memory properly. We're told that this bug has been fixed.)

The C8 uses MS-DOS-formatted 3.5" disks, which is handy if you want to back up files on your computer's hard disk. You can add up to 27 characters of comment to each file before saving it. Well, that's nice; unfortunately, the part of the operating system that will let you *read* the comments hasn't been implemented yet. Once they're stored on disk, they might as well be on Mars.

When we unpacked our first test unit, we found that the disk drive didn't work. It turned out that its power cable had come unplugged during shipment; a technician was able to fix it in two minutes.

A rear-panel nine-pin connector can be used to hook up a Microsoft-compatible mouse or trackball. Frankly, we don't think there are enough parameters on any given page to make it worth the trouble, but it's nice to see Peavey giving the user some extra options. Now, if you could use the trackball as a joystick controller. . . !

One of the hardware buttons is a panic button. This sends all-notes-off, sustain pedal up, and pitch-bend center messages on all 16 channels. If you continue to hold it, it will then transmit separate note-offs for all MIDI notes on all channels. (We noticed that the transmission of separate note-offs sometimes started a little too early, cutting off the last message or two in the first part of the transmission. Peavey reports that they haven't been able to duplicate this problem — and it's certainly not worth worrying about, since you can go years without needing to hit the panic button.)

The C8 has two MIDI data monitor modes. In one, you see icons for all six MIDI jacks, and little symbols flicker to show if data is appearing at each jack. In the other, incoming data can be displayed in hexadecimal. The latter is less useful than it might be because it's placed before the input filters in the merge section. If your external MIDI source is sending active sensing bytes, as many instruments do, the LCD will rapidly fill up with "FE FE FE FE," making it tricky to diagnose whatever else is going on.

Oh, by the way — the smiling bearded face that pops up on the LCD each time you switch the C8 on belongs to Hartley Peavey himself. We've never seen anything quite like it before on an electronic instrument.

Sys-Ex Buffer. With 128K of RAM and a disk drive, the C8 is ready and willing to download new banks of patches to all of your synthesizers in the middle of a gig. Bulk dumps can be transmitted over the MIDI output of your choice. The RAM buffer will hold several sys-ex packets at a time, and the LCD shows how much memory is being used. The contents of the buffer are not erased when the unit is switched off, which is terrific.

In the first unit we were shipped, a bad RAM chip at the input stage caused this feature to malfunction. Our bulk dumps were turned into MIDI hash (strings of poly aftertouch, note-ons, pitch-bends, etc.) before they even reached the storage RAM. Unable to duplicate the problem, Peavey shipped us a second unit so that we could see for ourselves that a defective part had been the cause. The second unit accepted bulk dumps like a champ.

Conclusions. While it isn't perfect (what is?), the Peavey C8 is easily the best MIDI master keyboard on the market. It has a ton of great features, the keyboard feels wonderful, and the price is right. Players who are concerned with nuance will appreciate the programmable velocity response, club musicians will enjoy having a disk drive and sys-ex buffer to load their synths with new patches between sets, and stadium rockers will be pleased that they can plug a strap-on keyboard directly into the C8 and have their splits and layers ready to go.

That's not to say that there aren't a few items we hope to see on the next software update. Being able to send MIDI program changes from the programmable buttons would be highly desirable in some musical situations, and you ought to be able to start and stop an external sequencer from a footswitch as well as from the front panel. But the instrument as it stands is thoroughly usable; if you're thinking of buying one, there's no need to wait for the update.

The C8 is an impressive achievement not only because it's designed so well but because it shows Peavey's determination to lead the way in the MIDI field. We're delighted to be able to congratulate them on an outstanding piece of equipment. ■

JLCOOPER MIXMASTER & CM AUTOMATION MX-816

MIDI-AUTOMATED AUDIO LEVEL CONTROLLERS

By Mark Vail

TRUE OR FALSE: MIDI HAS SPOILED us all. Not so easy to answer, is it? In many ways, MIDI has made keyboard players' lives a whole lot easier; on the other hand, it's caused many a headache, too.

One way MIDI has spoiled us is in the automation of the output level of our synths, using continuous controller #7 (MIDI volume). If only MIDI could be used to control levels for non-MIDI instruments and tape tracks!

Actually, it can. Dedicated MIDI-controlled audio mixers have been available since 1986, after Akai introduced their MPX 820 at the NAMM show that January. The eight-channel MPX listed for $1,995 and was based on a prototype device shown a year earlier by Zeta. Through the years, a number of MIDI-controlled mixers have come down the pike, including the $999 Simmons SPM 8:2 and the $3,995 Yamaha DMP7 (reviewed May and Aug. '87, respectively). Both of these were also eight-channel boards; the Yamaha was considerably more expensive because it offered the bonus of physically automated faders and two built-in digital processors. (Yamaha introduced a less expensive, rack-mount version without motorized faders, the $2,395 DMP11, in 1988.)

Also in '87, JLCooper introduced MAGI (Mixer Automation Gain Interface), the first of several MIDI-automated audio level controllers intended for use with conventional mixers. (JLCooper namesake and former *Keyboard* columnist Jim Cooper discussed MIDI-controlled audio mixers in his Mind Over MIDI column way back in Apr. '86.) Further developments led to JLCooper's MixMate ($995, reviewed Sept. '88), an eight-channel MIDI-automated level controller. More recently, we examined a pair of MIDI-controlled audio products, the Niche Audio Control Module and Mark of the Unicorn's Mixer 7s — reviewed Nov. '90 and May '91, respectively.

As promised in last-month's under-$600 mixer roundup, this month we're looking at a couple of new MIDI-automated audio level controllers: MixMaster, JLCooper's latest rendition, and CM Automation's MX-816. Both were designed to work in conjunction with a conventional mixer to control individual channel levels, although they will mix multiple incoming signals down to one or two outputs. Neither device will take the place of a general-purpose line mixer, mainly because they don't provide auxiliary sends to access outboard effects processors.

We used JLCooper's FaderMaster (reviewed April '91) to control and program both MixMaster and the MX-816. Many software sequencers provide on-screen fader facilities for controlling these products as well.

JLCooper MixMaster. When you read the words "MIDI Controlled Mixer" on its front panel, and then take a quick glance at its back panel, you're likely to believe MixMaster is a fairly straightforward 8 x 2 mixer. You'd be wrong. Instead, this product is most at home when you connect it via stereo audio cables directly to the channel inserts of another mixer for automated control of input signal levels. That's what MixMaster was designed for; its mixdown capabilities — which we'll discuss below — are actually an added benefit.

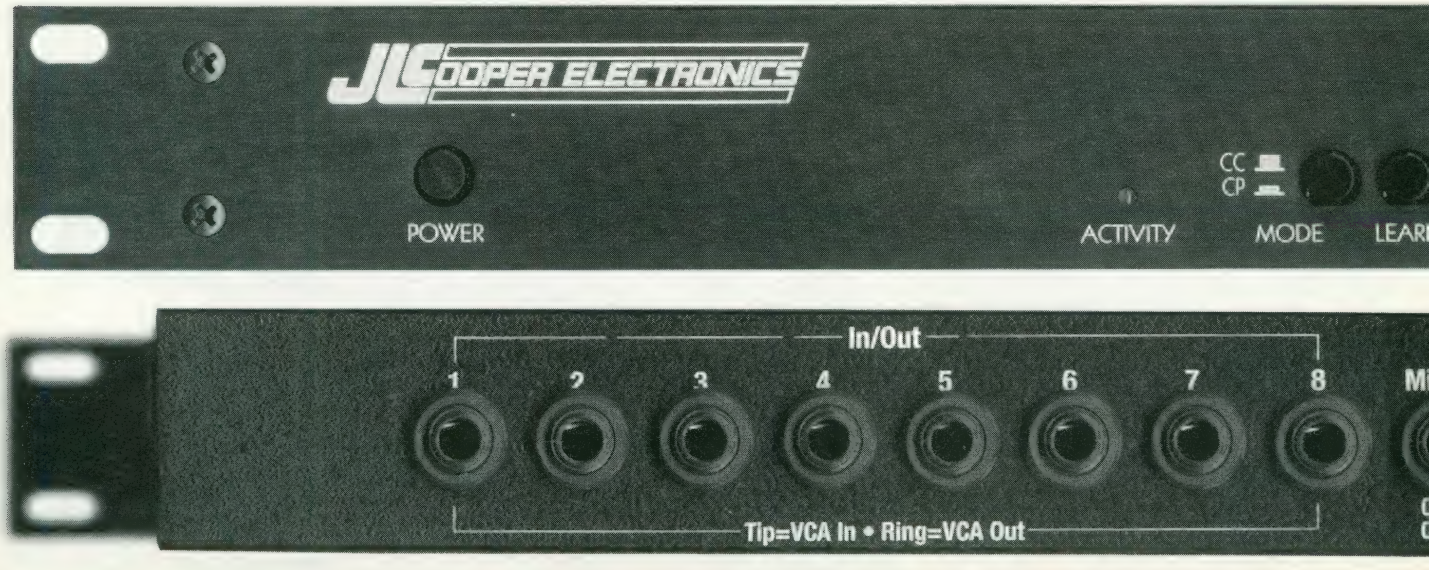
The first clue to MixMaster's real identity is the "in/out" label above eight of its ten 1/4" jacks; the remaining two jacks are labeled "mix in" and "mix out." All of these jacks are of the tip-ring-sleeve (TRS) variety, like the insert jacks found on many mixing consoles.

PROS & CONS

MixMaster: *Pros:* Ready-made for mixing console's channel inserts. MIDI-controlled panning. *Cons:* Use of mono 1/4" plugs isn't recommended. Limited to four input channels in stereo mode.

MX-816: *Pros:* Level snapshot storage. Preset and programmable automatic fade-ins and -outs. *Cons:* RCA in/outs. No stereo panning.

Don't be fooled by its subtitle — MIDI Controlled Mixer — because mixdown isn't the raison d'être *of JLCooper's MixMaster. Instead, MixMaster shines as a MIDI-automated audio level controller when used in conjunction with a conventional mixer that has channel inserts. All you need to incorporate MixMaster with a mixer's channel inserts are some stereo cables with 1/4" tip-ring-sleeve plugs at either end.*



MixMaster's front panel is simplicity itself. There's an on/off button, a power/activity LED that fluctuates to indicate MixMaster's reception of valid MIDI data (only data that it will respond to, which means it won't blink incessantly because of active sensing and whatnot), a "learn" button for programming the unit to respond to the MIDI continuous controller of your choice, and a mode button. The latter toggles MixMaster between consecutive-channel and consecutive-parameter modes. If you plan on using the unit as a stereo mixer, you'll only be able to use consecutive-channel mode, which means that each input channel will respond to a predetermined continuous controller over consecutive MIDI channels. In consecutive-parameter mode, MixMaster will assign the first controller you specify to the first input channel and consecutive controllers on the same MIDI channel to the following input channels. This is particularly useful if you can't afford to use up eight MIDI channels for automated level control. If the contiguous channel or controller limitation doesn't meet with your needs, it's possible to use system-exclusive messages to control MixMaster's VCA levels.

Want to use MixMaster for channel muting as well as continuous level control? No prob-

JLCOOPER MIXMASTER

Description: 8-in, 8-out MIDI-automated audio level controller with 8 x 1 / 4 x 2 mixing capabilities.
Memory: Controller and MIDI channel assignments retained at power down.
Features: Channel level control using continuous controller data, channel muting using MIDI note-ons. Consecutive-channel and -controller modes. Mix in allows multiple MixMasters to be used in series. MIDI out echoes all incoming MIDI data except system-exclusive. Configuration can be dumped and individual channel levels identified via sys-ex. For multi-MixMaster setups, master MixMaster will automatically configure slave units with unique ID numbers.
Interfacing: Eight channel in/outs, mix in, mix out (all 1/4" tip-ring-sleeve). MIDI in/out. Conical 9VAC power input (wall wart power adapter included).
Dimensions: 17" x 4-1/4" x 1-3/4". 6-1/3 lbs.
Suggested Retail Price: $499.95.
Contact: JLCooper Electronics, 12500 Beatrice St., Los Angeles, CA 90066. (310) 306-4131. Fax (310) 822-2252.

MIXMASTER-FRIENDLY CABLES

If you're set on using MixMaster as a dedicated MIDI-controlled line mixer, the fix for dealing with its tip-ring-sleeve in/out jacks is to buy a collection of stereo audio cables with TRS jacks at either end. You can insert a stereo plug into the outputs of most electronic instruments — at least those with mono output jacks — since the ring section of the plug won't touch any part of the instrument's jack. However, a few synths and stereo guitars have TRS jacks. In order to use one of these instruments with MixMaster, you'll need to sever the wire that connects the ring sections of the two TRS plugs.

To connect MixMaster's outputs to the inputs of a stereo amp or another mixer — or to connect the in/outs to a mixing board's sends and returns — get out your soldering iron, wire cutters, strippers (not the human kind), resin-core solder, some expendable mono guitar cables, and one 1/4" TRS plug for each pair of guitar cables. Cut off one end of each guitar cable at the plug, or unsolder the wires from the plugs if they have screw-on jackets. Solder the ground wires from two guitar cables to the sleeve section of each stereo plug, and separately solder the tip-connecting wires of these cables to the stereo plug's tip and ring sections. Now you've got a home-made Y-cord. The mono cable connected to the TRS plug's ring will carry channels 1-4 from MixMaster's stereo output; the other will conduct channels 5-8. Plug the same cable into an in/out and the tip contact will serve as the send cable, with the ring-connected cable carrying the return signal from MixMaster.

Don't care to make your own cables? JLCooper suggests you contact manufacturers of cables, such as Pro Co Sound, Rapco International, Conquest Sound, and Hosa Technology. They should have Y-cords that will fit your needs.

lem. The easiest way is to use MIDI note-ons: A note-on with a velocity of less than 64 will mute a specific channel; the same channel will be unmuted with the same note-on if the velocity value exceeds 64. As with continuous controllers or MIDI channels, MixMaster will automatically assign consecutive notes above the one you specify to mute/unmute consecutive input channels.

Thanks to the learn button, programming MixMaster is a breeze; just push the button, which causes the activity LED to blink, and transmit the MIDI data you want to control the level of channel 1. MixMaster will automatically assign the same controller on consecutive MIDI channels to the remaining input channels sequentially (or consecutive controllers on the same MIDI channel in consecutive-parameter mode). Although MixMaster will retain controller assignments when it's powered down, you may have to send it the appropriate controller data to reset its levels when you first turn it on.

In action, MixMaster responds very quickly to change input levels. We couldn't hear any zippering in volume changes, nor could we detect any degradation in the sound quality with MixMaster inserted in the audio chain. However, as explained in the sidebar on page 141, our audio tests revealed some difficulties that our ears didn't detect.

What if you really want to take advantage of MixMaster's mixing functions? First of all, you shouldn't connect normal 1/4" mono audio cables to MixMaster's in/outs. The ring portion of each in/out jack carries the output signal, and a mono plug would short this signal to ground. In spite of the specific warnings posted in the manual, JLCooper tells us that they have plugged several mono plugs into these jacks for an extended period of time without causing any damage to the unit; they claim it only causes the unit's power supply to heat up more than normal because of the additional power drain. However, they also mentioned that using multiple mono connectors might decrease MixMaster's headroom. While such a design is perfect for connection to the TRS insert jacks on many mixing boards (so that a single jack handles both input and output in the signal path), it's inconvenient for those who pack a load of common 1/4" audio cables. (See the sidebar on page 139 for our MixMaster-friendly cord-construction recommendations.)

Once you're set with stereo input cables and a stereo Y-cord, MixMaster will be ready to serve as a mixer — again, sans auxiliary sends and returns. In stereo mode, MixMaster is limited to four input channels, because channels 5-8 are dedicated to the opposing side of the stereo mix. In other words, the VCAs in channels 1-4 handle one side, and those in channels 5-8 take care of the other, allowing you to effectively pan a mono source signal across the stereo field.

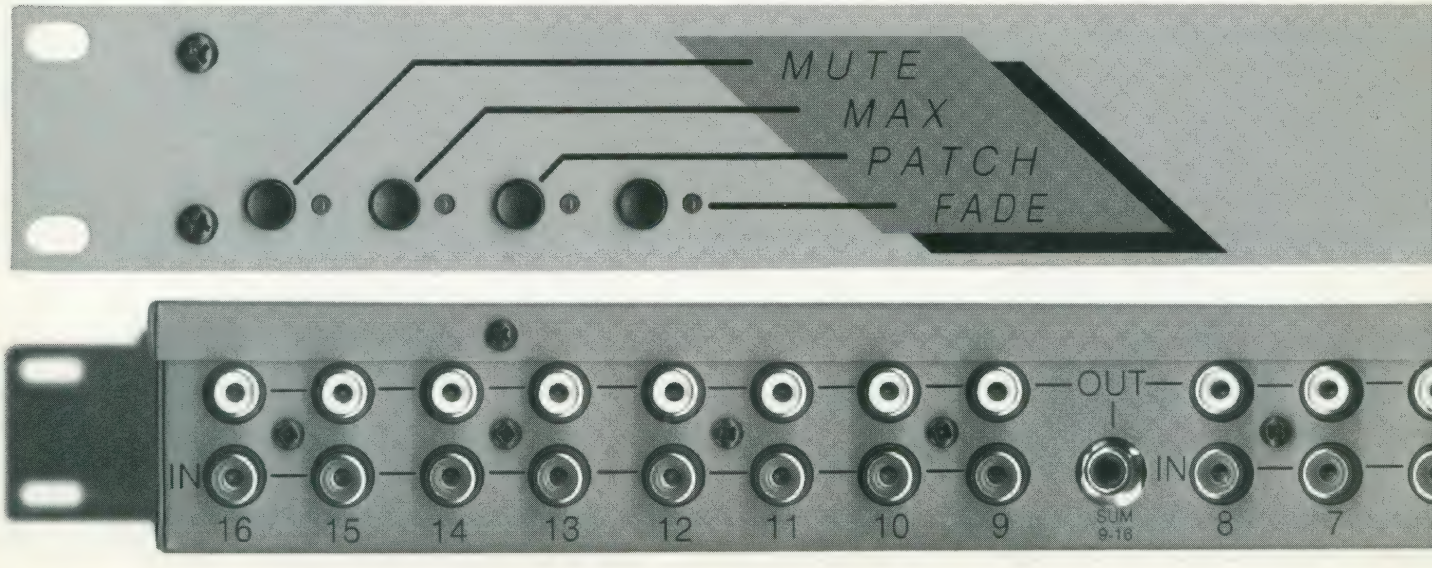
MixMaster will also function as an eight-channel stereo mixer, but input signals will be hard panned left or right, depending on which input is used (channels 1-4 go left, 5-8 right). Or you can mix eight inputs down to one output. You can switch MixMaster between stereo and mono modes by sending it a program change above or below 32, respectively. If you want MixMaster to stay in stereo mode permanently, JLCooper can fill you in on which internal jumper to cut.

Don't be misled by the name on its front panel: MixMaster wasn't designed to be a stand-alone MIDI-controlled mixer. Although it can be used as such, it's not suited to that application. It really shines, though, as a MIDI-automated audio level controller for use with a channel-insert-fortified mixer. In that application,

CM AUTOMATION MX-816

Description: 8 or 16 in/out MIDI-automated audio level controller with mixdown capabilities.
Memory: 100 snapshot patches, 16 preset autofades.
Features: Manual and auto fading from patch to patch (programmable up to 30 seconds). Toggled, gate-on, and gate-off channel muting. Sys-ex device numbering allows up to 128 MX-816s to be used in a system. External storage of MX-816 memory contents via system-exclusive dump; single patch dumps and reception allowed. MIDI out echoes incoming start, stop, continue, clock, program change, controller, and sys-ex messages. Ground-lift switch.
Interfacing: Eight or 16 inputs, eight or 16 outputs, one summed output for each set of eight inputs (all gold-plated RCA). MIDI in/out. Conical 9VAC power input (wall wart power adapter included).
Dimensions: 17-1/4" x 6-3/4" x 1-3/4". 5-1/4 lbs.
Suggested Retail Price: 8-channel model, $489.95. 16-channel model, $779.95. 8-channel expander, $289.95.
Contact: CM Automation, 402 Museum Dr., Los Angeles, CA 90065. (714) 488-0024.

A splash of orange highlights the tan front panel of CM Automation's MX-816. Hidden behind that panel are some useful automated fade functions and 100 level snapshot locations. There are 16 inputs, 16 outputs, and two summed outputs on the 16-channel version of the MX-816. The eight-channel model comes with a blank plate where in/outs 9 through 16 and one of the summed outputs would be.



you'll really come to appreciate JLCooper's choice of TRS in/outs.

CM Automation MX-816. CM Automation's MIDI-controlled box does much of what MixMaster does. One difference is that the MX-816 has gold-plated RCA jacks and comes with eight or 16 ins and outs. If you want to start with the eight-channel model, you can always expand it later to 16 channels. Both use the same single-space cabinet; the expansion involves the removal of a blank plate from the back panel and the insertion and connection of another eight-channel circuit board. (Since we looked at the 16-channel version, we'll refer to it from now on. The eight-channel model deals with half as many controllers, inputs, and outputs.) Because of its RCA jacks, the MX-816 might be more suited to the home studio than on the road, because RCA plugs aren't as heavy-duty as their 1/4" counterparts. Carl Malone, developer of the MX-816, tells us he chose RCA connectors because it would be impossible to squeeze 32 1/4" jacks into a single-space box. He decided against 1/4" TRS jacks because most commercially available stereo audio cables don't provide separate shields for the send and return lines, and are thus susceptible to crosstalk between these lines.

There are four momentary buttons and four companion LEDs on the MX-816's front panel. These button/LED combinations are labeled fade, patch, max, and mute. Depressing the max button will light the max LED and bring all input channels up to full volume; pressing it again will return them to the previous levels. The MX-816's fade button is somewhat like MixMaster's learn button: Press and release it, transmit the controller you want to control channel 1's level, and the MX-816 will automatically assign the following 15 controller numbers to channels 2 through 16. Whatever controller is 17 numbers higher than the one you chose to control channel 1 will function as a fader between the last two selected patches. Called the "joystick fader," this allows you to manually fade between MX-816 patches.

SPEC TEST RESULTS

JLCOOPER MIXMASTER

Frequency Response, Channel Bus: 20Hz – 20kHz +0.01/–1.41dB ref. to 1kHz; –3dB from 1kHz ref @ 32.4kHz
Maximum Output @ 1kHz: +14.2dBu
Nominal Output Level Quiescent Noise (4 channels): –92.25dBu (unweighted), –95.38dBu (A-weighted)
***THD+n* (22Hz-22kHz):** <0.1797% (unweighted), <0.0256% (A-weighted)

First up is MixMaster, whose frequency-response curve dips down 1dB just past 16kHz, and continues downward to around 33kHz where it's 3dB below the level measured at 1kHz. Distortion in the lower frequencies (between 20 and 100Hz) was on the high side, a byproduct, according to JLCooper, of the VCA design. (Typical distortion was around 0.027%) We ran our THD+n tests at both the unit's rated –10dBV input level (results printed above) and our standard 0dBu level. What we found: If you plan on using MixMaster with higher level signals, count on significantly increased distortion. (With a 0dBu input we measured 0.42% at 20Hz.) When we A-weighted the measurement, the reading was a far more respectable 0.0256%. By our measurements, MixMaster's fader attenuation clocked in at about –80dBu. The manufacturer used a different test methodology and came up with an attenuation figure of -87dB.

CM AUTOMATION MX-816

Frequency Response, Channel Bus: 20Hz – 20kHz +0.08/–0.25dB ref. to 1kHz; –3dB from 1kHz ref @ 80kHz
Maximum Output @ 1kHz: +22dBu
Nominal Output Level Quiescent Noise (4 channels): –88.42dBu (unweighted), –91.18dBu (A-weighted)
THD+n (22Hz-22kHz): <0.0482% (unweighted), <0.0520% (A-weighted)

The MX-816 out-gunned MixMaster in frequency response. Channel bus response far exceeded that of the mix bus — the former stretching out to 80kHz before dropping 3dB below the level measured at 1kHz, the latter getting there around 52kHz. The MX-816's nominal level distortion (typically less than 0.048%) matched that of a couple of middle-of-the-pack mixers from last-month's round up, but oddly enough the distortion increases as the input level increases. (The MX-816 reportedly uses the same VCAs as MixMaster.) Thus +4dBu gear will suffer from more distortion than –10dBV gear, and hot transient signals will be considerably more distorted (as much as 0.1% with a +22dBu signal) than lower-level signals. This could lead to problems in +4dBu pro applications.

MIDI AUDIO CONTROLLERS

Patches? While MixMaster lacks memory for preset levels, the MX-816 provides 100 memory slots for level "snapshot" storage. Like the patches in a synthesizer, MX-816 patches can be recalled using program change messages. However, since there's no numerical display, you'll have no visual indication of which MX-816 patch is active. This can also cause problems when you save new patches, because the chances of overwriting an existing patch are much greater. (Keep a piece of paper handy to document the patches already in memory.)

When you program a snapshot patch, you can impose up to a 30-second fade period for the levels defined in the patch to take effect — a superb feature, and the fades are very smooth. Say one patch consists of even channels being at full volume and odd channels at zero, and a second patch has the opposite settings and a fade-in period of ten seconds. If the MX-816 is on patch 1 and you select patch 2, it will take ten seconds for the odd channels to go from volume levels of zero to 127 and the even channels from 127 to zero. The actual time that elapses depends on the "distance" a fader must travel; if one channel changes from half to full volume, it will take half of the programmed fade-in time for that channel to traverse from the original level to the new one. The patch LED will glow until all fade levels reach their destinations. Of course, if you don't program a fade-in period, the conversion from the first patch levels to the second will be practically instant. To program a fade-in, you send one MIDI note per second of fade period. The MX-816's fade LED will alternate on and off for each note it receives. Whenever you edit a patch, you'll need to reprogram the fade-in period, but it is possible to alter the fade-in period of an existing patch.

In addition to the 100 user patches, the MX-816 offers 16 preset fade-ins and -outs, which are accessible using program changes from 100 to 115 — contrary to the manual, which states there are 28 preset fade-ins/outs from 100 to 127. Even-numbered patches in this range are fade-ins; odd patches are fade-outs. The fades range in time from two to 30 seconds, and affect all channels equally. The patch LED blinks throughout these fade-ins and -outs.

Unlike MixMaster, the MX-816 only works with contiguous controllers on the same MIDI channel; it doesn't offer the option of using MIDI volume on consecutive MIDI channels. Even though they don't offer the choice, at least CM Automation chose the way to address level control that doesn't use up a bunch of MIDI channels. The MX-816 also offers channel-muting via MIDI notes. CM Automation's mute implementation is a little more flexible than what JLCooper provides in MixMaster. There are three muting modes: toggle, in which the same note will alternately switch a channel off and on (regardless of velocity values); gate-off, in which a channel will be muted only as long as its associated note is depressed; and gate-on, in which the channel will remain muted until its note is played. As with MixMaster, when you inform the MX-816 which note will mute channel 1, it will automatically assign the next 15 notes to the remaining channels. The seventeenth note above the first will mute all outputs — as will the front-panel mute button when you depress it. When any MX-816 input channel is muted, the mute LED will blink; in this case, depressing the mute button will unmute all channels.

On the down side, the 16-channel MX-816 is purely a twin 8 x 1 mixer. The pair of summed outputs are fixed to either channels 1-8 or 9-16. Therefore, all sources remain on either the left or right side of the stereo mix; there is no panning. What about specs? While the MX-816 has a better frequency response than MixMaster, note its distortion characteristics in the sidebar on page 141. In addition, we're concerned about the longevity of the MX-816's AC power adapter, which gets mighty hot while in use. On the good side again, there's a ground-lift switch, a bonus that will help you battle noise induced by grounding inconsistencies in your setup.

With its automated and manual fade functions, the MX-816 offers some invaluable level-control operations for non-MIDI instruments and tape tracks. Highly recommended — provided you can deal with RCA jacks and the penalty for too-hot input signals.

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Pro-Rec

"One of the best sound cards I've ever heard!" Review of JV-80 SuperSynth

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AKAI MX1000

MIDI MASTER KEYBOARD

By Jim Aikin

AT ONE TIME OR ANOTHER, MOST of us dream about owning a dedicated MIDI master keyboard. Who wouldn't want a weighted action, multiple zones, a choice of velocity response curves, and some extra control sliders? Even so, money is tight, and many of the newer synthesizers have features that allow them to double as reasonably powerful MIDI master controllers. So if you're thinking seriously about buying an expensive piece of gear that won't make a squeak of sound by itself, you probably fall into one of three categories: either you have money to burn, you need a primo 76- or 88-key weighted action along with more MIDI features than you'll find on a typical digital piano, or you have a complex MIDI rig and need to make big-time musical demands of your master keyboard.

How well does the Akai MX1000 mesh with these three sets of needs? If you're in the first category, you don't need to read this review, just go spend some money. Keep the industry pumping. If you're in the second category, you may want to wander into a store and try playing an MX1000. Our impression is its action is a little springy. If you play and hold a note with nothing but finger weight, the key will push upward against your finger harder than the key on a grand piano will. This makes the repetition action nice and fast — but if you use the classical technique of relaxing your hand on the keys while still holding them down, you could experience some fatigue when playing the MX. On the positive side, the programmable velocity curves are a great way to get a better response out of a keyboard.

If you're in the third category, the demanding professional user, you may be disappointed with the MX1000's features. While it's a solid performer, it really fails to go the extra mile.

It's been two years since we reviewed the MX1000's predecessor, the MX76, in our Aug. '90 cover story on master keyboards. That unit suffered from a couple of major design problems that have been fixed in the MX1000. On the other hand, the MX76 did a couple of things that the MX1000 won't do, such as send sequencer start/stop commands from a front-panel button. Since the two units are priced exactly the same, and since the newer one still falls short in some areas, it's a shame to see useful features being eliminated from the design.

PROS & CONS

Pros: Programmable velocity curves. Four independently addressable MIDI outputs. Input merging for remote keyboard.

Cons: Plugging in a footpedal shuts off the corresponding front-panel MIDI slider. Won't transmit non-Akai sys-ex or MIDI clocks.

Overview. As long as your needs are fairly straightforward, you should find the MX1000 a very effective musical tool. It lets you spread four zones across the keyboard. The zones can overlap, and each can be given its own MIDI channel, transposition, pressure sensitivity, program change, initial volume level, and so on. The unit also has four MIDI output jacks, and each zone can be set to transmit on any combination of outputs. You'll find four programmable sliders, four programmable buttons, four programmable footswitch inputs, and four programmable sweep pedal inputs, all of which can be set up differently for each preset.

The MX1000 stores 100 presets. These can be chained and stepped through with a footswitch. Four different chains are provided. And when you're in chain mode you aren't stuck with the preset order. If you should get a mad impulse in the middle of a tune (or if a module should go dead on you), you can select any preset directly, using the front-panel preset select buttons.

A MIDI input jack is provided, allowing the MX1000 to be used with a second keyboard or alternate MIDI controller, and you can switch the merging out/thru from this remote keyboard on or off for each zone in each program. Other features include a MIDI data monitor, with which you can display and inspect incoming or outgoing MIDI data, and a copy utility that lets you copy either an entire preset or certain types of data within a preset to a different memory location. The LCD provides graphic editing for velocity curves and keyboard zones.

Sounds pretty respectable so far, right? Nothing spectacular, but a decent musical tool. Unfortunately, what we've just described is the good stuff. From here on, the road starts to get bumpy.

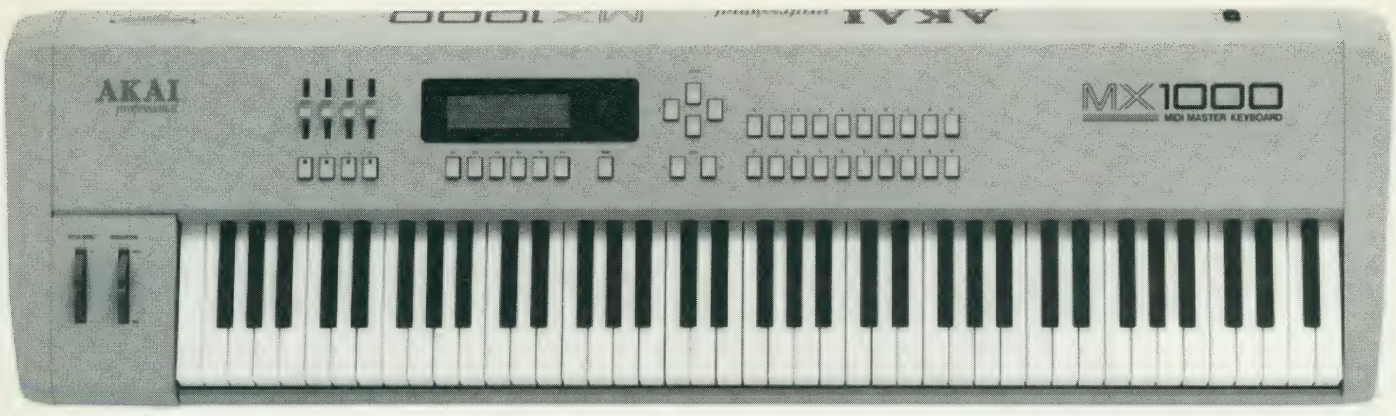
The first thing we noticed was that the footswitch polarity isn't reversible. If you've got the wrong kind of footswitches, you'll have to shell out more bucks (and contribute to the world's supply of plastic pollution) in order to get full functionality out of the MX1000. Footswitch polarity reversal is not an esoteric concept. It's been a feature on many synthesizers for five years now. Some instruments will sense the footswitch's position automatically when you power up, so they'll operate correctly no matter which kind of footswitch you have. But not the MX1000.

The merging MIDI input is implemented in a constricted way. As we said, you can switch each zone within a preset on or off for merging purposes. But in addition to this, the second keyboard must be transmitting on the correct MIDI channel for that zone. The MX1000 won't rechannelize the input; if the input is on the wrong channel, merging simply doesn't occur. If you're out there in the spotlight wailing on your strap-on, the last thing you want is to have to change transmission channels between the verse and the chorus. You want the smart software in the master keyboard back there in the shadows to do the rechannelizing for you. Not only that — if the MX1000 is set up for a split keyboard, you'd like to have the split reflected on the remote automatically (as it is on the Peavey DPM C8 — see page 134), rather than having to program an identical split in the remote.

And what if the merging zone is programmed for a transposition? Will the remote keyboard's input be transposed? No. Again, if you want the remote to have a transposition, it must be programmed on the remote itself. As a matter of fact, you might like your sequencer to be able to change presets on the MX1000 automatically, if you're off on another part of the stage. But the MX doesn't respond to program changes.

If you plug a sweep pedal into any pedal input, the associated slider (that is, the one with the same number) is disabled. At least, that's what we're told is supposed to happen. Akai shipped us no pedals with the test unit, so we couldn't test it. Maybe this is a sensible place to cut corners, and maybe it's not. We can't help feeling bemused about an instrument that's designed in such a way that the front-panel MIDI controls sometimes go dead.

We almost hate to gripe about the fact that the rear-panel jacks are not labelled along the back edge of the top panel. Not all synthesizers have this feature either, but you'd think that with a master keyboard, where interfacing is the *only* design issue worth discussing, that they'd do



The Akai MX1000 has programmable velocity curves and will send program changes from its programmable buttons.

it the right way. They didn't.

Zones. We've already mentioned the basic parameters that can be programmed for each keyboard zone (which Akai calls a key group): MIDI channel, on/off for each output jack, and transposition in half-steps. Pitch-bend depth can be scaled down from its normal maximum, which lets you bend single notes into chords when your zones overlap (assuming that you've started by programming some of the receiving modules to bend depths greater than a whole-step). Likewise, mod wheel depth can be scaled down.

Two aftertouch parameters are provided. Of the first, the manual says, "The large value is set, the large pressure data (aftertouch) is transmitted." Of the second, it says, "The large value is set, the more strongly you should press the keys for after pressure." Clear as mud, right? It turns out that the first parameter is for scaling — that is, reducing all of the values proportionately by a percentage. The second raises the physical threshold at which pressure data starts being sent. The cool thing is that if you use the threshold offset without scaling, you'll still get a full value of 127 when you press hard. You just have to press harder to get it. If you've overlapped two zones to create a layer and you want them to respond differently to aftertouch, this design will give you a good tool to work with.

The sustain pedal can be switched on or off for each zone — but only if your pedal is plugged into the dedicated sustain pedal input jack. If you've programmed one of the four programmable footswitches to act as a sustain pedal, it will continue to operate even when the sustain pedal parameter is switched off for that zone.

Because of the way the output and channel assignments are configured, the MX1000 isn't quite a 64-MIDI-channel device. True, if you've got four full racks of 16 tone modules each, with one rack hooked to each output, you can address each module individually. But certain combinations aren't possible. If a zone is switched on for all four outputs, it must play the same channel, and only that channel, on all four. Usually, if this creates a musical problem, you'll be able to set up a second zone to cover it. But if you need to spread four zones across the keyboard and have one play channel 8 on output A layered with channel 3 on output B while the other three zones are doing other things, you're out of luck.

Velocity. Definitely the MX1000's strong suit. Six preset curves and eight programmable ones. Curiously, while preset curve 1 is flattened out in the middle rather than strictly linear, it gives a more musical response — to our ears, anyway — than a linear curve. Maybe that has something to do with how the hardware senses your actual key velocity. The programmable curves are shown graphically on the LCD. They're easy to adjust, and a copy utility is provided. By programming a curve with a negative slope, you can do velocity crossfading between overlapping zones.

You can give each keyboard zone a gentle velocity taper — especially useful if a particular patch tends to scream at the high end. It might be nice if the maximum depth of this taper were greater than ±10. Likewise, the velocity output of each zone can be offset by ±10. If you need more offset, simply use a programmable curve.

Data Transmission & Reception. In addition to the program changes that you set up for the four keyboard zones, up to four additional program changes can be transmitted when you call up a preset. This is a standard type of feature for changing presets on MIDI effects devices. You can switch it off if you don't need it. Unfortunately, you can't switch off the program change transmission for your zones. Each time you call up a preset, those four program changes will be transmitted, whether you want them to be or not. This is only likely to be a problem in a few specialized situations, such as if you're designing layered sounds in the studio or playing live on the same channel as a sequencer. But it still qualifies as poor design.

When you hit a slider or button, a pop-up window in the LCD shows exactly what data has just been transmitted. This is a cool idea, one that we hope other manufacturers will pick up on. It saves any amount of confusion.

The sliders and sweep pedals will transmit

AKAI MX1000

Description: MIDI master keyboard.
Keyboard: 76 keys, *E* to *G*, oil-damped action. Velocity, release velocity, and channel pressure sensing. Programmable velocity response.
Other Performance Features: Pitch-bend and modulation wheels, four front-panel sliders (programmable), four front-panel buttons (programmable).
Memory: 100 presets, four preset chains, ten four-note chords, eight user velocity curves.
Features: Each preset contains four overlappable keyboard zones, four programmable footswitches, four programmable buttons, and four programmable sliders or footpedals. Buttons and footswitches can transmit four-note chords or program changes. Each zone has MIDI channel and output(s), velocity range and offset, program change, volume setting, transpose, pressure scaling and offset, and wheel ranges. MIDI input routing to output can be switched on for any zone. 8 x 40 character backlit LCD with graphic velocity curve editing. Optional PM76 piano tone module can be installed.
Interfacing: Four sweep footpedal ins, four footswitch ins, program advance and sustain footswitch ins (all 1/4"). Memory card slot. MIDI in, thru, four outs.
Dimensions: 50-3/8" x 14-7/8" x 4-3/8". 45 lbs.
Suggested Retail Price: $2,299.00. PM76: $999.95.
Contact: Akai/IMC, Box 2344, Fort Worth, TX 76113. (817) 336-5114. Fax (817) 870-1271.

any MIDI controller, bend up, bend down, or aftertouch. (Since they're functionally identical and are programmed on a single screen, we'll refer to them strictly as sliders from here on.) Each slider can be assigned to any combination of the four zones, but can send only one type of data. This means you could assign a single slider as a master volume control for four synths, and still have three sliders left for other functions. And of course the slider functions are separately programmable for each preset. Each slider can also transmit on an extra channel of your choice, and this extra channel can be switched on or off for each output — very useful if you've got a reverb with real-time MIDI control, for example.

The good news is that unlike the earlier MX76 (and the Roland A-80), the MX1000 doesn't transmit the current physical positions of the sliders each time you call up a new preset. At the same time, a couple of slider features that some people are sure to want are missing. There's no scaling of the output values; full range is all you get. And there's no zone-dependent inversion, so you can't use a single slider as a volume crossfader between two modules. What about using a slider to control the velocity offset for a zone? If you want to do something that sophisticated, you'll have to go buy a computer and learn to program Max or Interactor. At that point, the MX1000's sliders become a very nice front end, capable of sending data entry values, for example. But we can't help wishing the smarts were in the master keyboard itself.

Want to assign a slider to a specific byte within a short sys-ex packet, so as to control some parameter on a synth that doesn't have the right kind of modulation inputs? Sorry — the MX1000's sliders won't do that either. Except for the ability to download its own memory contents via sys-ex, it has no sys-ex functions at all, which makes it less powerful than Yamaha's venerable KX88, the Roland A-80, or the Elka MK88.

The functions of the programmable buttons and footswitches are just as limited. You have a choice of momentary or toggle operation, which is nice. The programmable chord function is discussed below. And each switch can also send out, on any channel and output jack, the program change of your choice — an indispensable feature. But what about using a button to cue up an octave transposition, or to switch between two preset volume levels for a zone, or to turn the pitch-bend for a zone on and off, or to move the split point between zones, or to send a bank select command, or . . . ? None of these things can be done with the buttons. You can accomplish most of them (with the exception of bank select, which is a MIDI message the MX1000 simply won't transmit) by setting up adjacent presets and switching back and forth — but of course you can't do that while sustaining notes on the keyboard. The MX1000 itself will sustain notes with their full duration while switching its own presets, but since it also transmits an all-notes-off command for each zone when you leave a preset, this isn't much use.

Although you won't find this information in the manual, the sweep footpedal inputs transmit a five-volt current from the tip of a tip-ring-sleeve connector, and read the voltage that returns on the ring. You'll need to buy (or wire) a pedal with an attenuator that pulls this five volts down toward zero. We tried plugging in a single pedal of the wrong type, and found that it was acting as if it were all four sliders at once. Actually, that could be a feature. If you need a single pedal to send four types of data, you're in luck.

Oh, by the way: The pitch-bend and mod wheels are not programmable. You can scale

their output for each zone, as already noted, but you can't change the type of data transmitted from them, or reverse the pitch wheel so it bends down instead of up.

As we noted above, Akai's earlier MX76 master controller would transmit both MIDI clocks and start/stop commands, but this feature has been eliminated from the MX1000. The newer unit does, however, have a dedicated front-panel panic button, which sends all-notes-off commands on all 16 channels on all four outputs. In addition, this button sends sustain pedal offs, pitch-bend center values, and mod wheel zeroes for all 16 channels — all very helpful. More debatable: The panic button *sends MIDI* volume commands of 127 on all 16 channels. If you're playing live along with a sequencer, this is *not* necessarily what you want a panic button to do.

When we layered all four zones, switched on all four outputs for all the zones, and played thick chord clusters with both hands, the MX1000 intermittently freaked out, transmitting only two or three notes total for a blockbuster chord. At a guess, its output buffer was filling up and being flushed before the notes were transmitted. When only three outputs were switched on, the problem never occurred.

Chords. The MX1000 will memorize up to ten chords of up to four notes each. (That's ten chords as a whole, not ten per preset.) Chord notes are entered directly from the keyboard, and your velocity values are stored as well as the note numbers, which is certainly a plus. Any chord can then be assigned to any button or footswitch. As with other button/switch commands, you can choose between momentary operation (the chord starts when you push the button and stops when you lift your finger) and toggle operation (one button-press starts the chord, the next stops it).

This feature could be very nice if you want to start a bass drone with a footswitch and then solo over it. Even so, the design feels half-finished. Why not let the user assign chords to the keyboard itself, so that they could be played with velocity, transposed with a single finger, and so on? Why not allow multi-channel chords?

Conclusions. For the musician whose needs are not too far out, the MX1000 could be a reasonable choice. Four keyboard zones, programmable velocity curves, sliders to send a few volume changes — no problem. Where the instrument falls short is in the area of advanced functions. Except for a few little knicknacks like the left-to-right velocity scaling, it doesn't have any. Maybe we're just disappointed because we're greedy for ultra-flashy new features. We'll let you decide for yourself. Basically, the MX1000 qualifies as a dull but dependable performer. On the other hand, the Peavey C8 master keyboard (see Keyboard Report, page 134) has several significant features that are missing from the MX1000, plus a better-feeling keyboard, and it retails for several hundred dollars less. True, the MX1000 has programmable velocity curves, and it will send program changes from its front-panel buttons — but we doubt that those two features by themselves are going to sell a lot of hardware. ■

TORI!

Continued from page 51

to write four different bridges for this song and we'll see who wins the prize." And then it's like, "What if I change this chorus? What if I just cut it in half?" That all happens sometimes. You can't be afraid — and I used to be — of experimenting. "Boy, I can never come back to that?" But that's saying, "I don't have it yet." We always want to be able to just get it. I was able to get to the place on this record where it was okay if I didn't have it yet. I'd walk around with these songs stalking me. We'd be going out to a movie and I'd start jittering. The songs themselves, they want to be something. I would just open myself up to reading things, and it would show me that I didn't have to say "I'm leaving" by saying "I'm leaving." That's what watching a lot of movies does for me. I see how the camera angle goes. I see how the lighting is. How did they get this across? You know, write like you're a camera.

The other big thing is keeping my musical vocabulary up. "Why do I always go to this change?" It gets to be habit. Your ears get so used to, "I want it to resolve here." A string arranger once said to me, "You can't do this. You can't go here." And I went, "Who said that? Who made up that rule? And what grave is he in over in Europe? Who cares? The worms have eaten him. It's over." And that's where the vision gets lost. But you have to know when it's working or not. And I know when it works. It's really great. I'm so glad I do [*laughs*]. And when it doesn't, it's unacceptable to let it fly. Even if that tune never gets out.

• • • • • •

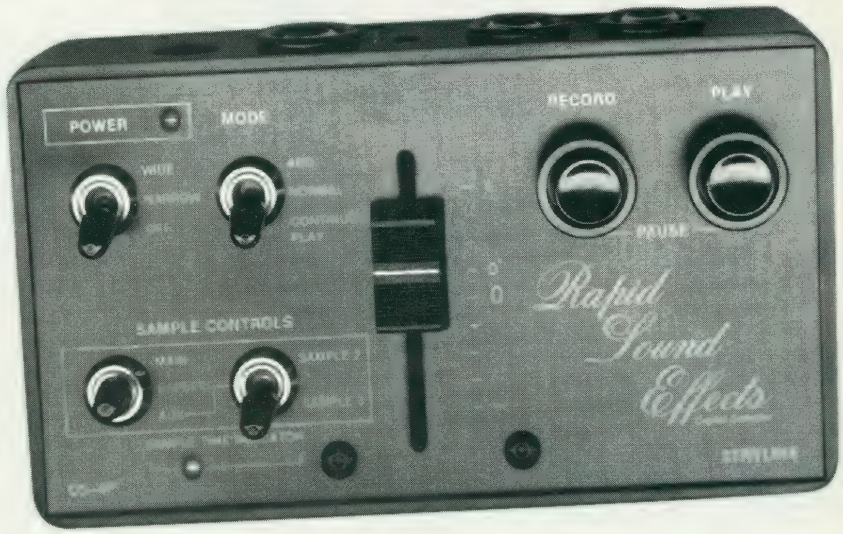
Running short on time, we shut off the tape recorder and headed toward the venue for a pending photo shoot and soundcheck. On the way out of the restaurant, we asked Tori one final question: "Were there any compromises on *Little Earthquakes*?" "Songwriting-wise," she answered, "there were no compromises, absolutely none. Every note and every lyric — none. It always comes down to, 'Could the hi-hat have been this, or whatever?' There's always 100,000 choices. 'Did I want this effect on my voice?' I go through those things. But hey, they are what they are. This record is what it is. You've gotta stop somewhere. You've got to cut the string." ■

STRYLINE DS-4P RAPID SOUND EFFECTS SAMPLER

Stryline DS-4P: Suggested U.S. retail: $365.00. Distributed by Current Innovations, 1500 Lincoln Ave., Winnipeg, Manitoba, Canada R3E 0Z1. (204) 771-4707. Fax (204) 889-5602.

Pros: Ultra-compact. Easy to use. Pitch-control slider. Auto-looping.

Cons: Not MIDI-compatible. No external triggering. Samples are erased when the unit is powered down.



The DS-4P, shown here at actual size, offers up to 80 seconds of sampling, a pitch control slider, and — most importantly — will fit comfortably inside your mouth.

IT'S TOUTED AS "THE WORLD'S SMALLEST Sampler," and we're inclined to agree. At a whopping 4" x 2" x 1" (that's inches, not feet) the DS-4P sampler will fit into your hip pocket, literally. What it is: A one-shot, 10-bit sampling device ideally suited for the samplerless deejay or the gadgetphile. What it isn't: A replacement for a pro sampler in a keyboard rig.

The DS-4P is a snap to operate. Its sample RAM is partitioned into three separate blocks. The main block can house a single, two-part sample. Each part can be played back individually, or the two can be strung together or rearranged via the RAP feature (more on that below). The auxiliary blocks, labeled Sample 2 and 3, can store one sample each. The maximum sampling time for all samples combined is approximately 80 seconds at 5kHz bandwidth (wide mode), or 40 seconds at 10kHz bandwidth (narrow mode). Unfortunately, all samples are erased when the unit is powered down.

There are two RCA inputs and one RCA output, plus an input for the unit's AC wall wart (external power supply). You'll also find a recessed trim knob that widens or decreases sampling time in narrow mode.

The DS-4P might not be the cleanest sampler by technical standards, but you should be the judge of whether or not it meets your needs. Grainy sample quality is often desirable in hip-hop and dance music.

Recording a sound is as easy as pressing and holding the record button. Removing your finger from the button will signal a sample's end point. Other than choosing between narrow and wide mode, that's it.

One particularly slick feature is the Return Address Point (RAP). This function allows a dividing line to be inserted within a sample. Why is this useful? Here's an example: Let's say you sample yourself saying "ABCDE." When you've programmed a RAP point, the first part of the sample could play only "AB," for example, while the second part could play "CDEF." Some cool effects can be achieved by switching between these two parts. If you don't like it, try it again. This time, you could program "ABCD" for part one, and "EF" for part two, and so on. While the DS-4P can hold only one RAP in memory at a time, the point can be applied to any of the three sample blocks.

The editing capabilities of the DS-4P are bare-bones. You can change the sample and playback rates in real-time and loop a sample by holding the play button down (or by turning on the continuous play switch). That's about it. Short of changing the RAP, no truncation utilities are provided; you'll have to resort to good ol' trial and error, recording the sample as often as necessary to get it nailed.

We discovered one problem when sampling. If you're trying to capture a long passage (say, 16 bars of a pre-recorded groove) it is imperative that you remove your finger from the record button before the internal memory maxes out. Otherwise, the DS-4P will cycle back through the start point and erase everything in its path. We feel the unit should automatically stop when the memory fills up, thus preventing accidental erasure. There is a warning light that illuminates when half of the memory has been used, but it isn't a real solution to the problem. The only fool-proof method is to use a stopwatch.

Once you've captured your samples, the fun begins. Each sound can be yanked up or down over a 1-3/4 octave range with the pitch slider. Stuttering effects can be achieved by tapping the play button in rapid succession, and samples can be paused at any point during their playback by pressing and holding the record button in conjunction with the play button. Be careful, though. If your finger slips off the play button, you'll erase the existing sample. A safety switch would have been beneficial here.

The DS-4P can be a handy tool for musicians who transcribe or analyze pre-recorded music. Sample a musical passage into the unit, pull down the pitch fader, and listen to the playback in slow-mo. Sheds new light on pieces such as Zappa's "Black Page, Number One."

The verdict? Well, we could ramble for paragraphs

Two hundred feet of MIDI cable? Believe it! Gravitron's MIDI-Optimizer, constructed of fiber-optic cable, comes in lengths ranging from six to 200 feet. Although the power wire on this prototype is only 3" long, the production cables will have 12" wires between the MIDI out and piggyback MIDI jack connector.

GRAVITRON MIDI-OPTIMIZER FIBER-OPTIC MIDI CABLE

MIDI-Optimizer: $19.95 to $199.95, 6' to 200' respectively. (Longer cables available via custom order.) Gravitron Systems, Inc., 12841 Hawthorne Blvd., #138, Hawthorne, CA 90250. (310) 352-4149. Fax (310) 532-2287.

Pros: Immune to external interference. No restrictions on length. Draws power from destination device's MIDI out or thru without monopolizing that connector.

Cons: Incapable of carrying power for devices that require it over the MIDI line.

AS DEFINED BY THE MIDI SPEC, CONventional MIDI cables are limited to a maximum of 50' in length. Using cables that exceed this length could result in the MIDI data being subject to interference that could corrupt said data beyond recognition.

What do you do if 50' isn't enough, make an "illegal" long MIDI cable and gamble against data errors? Gravitron Systems has a better solution: Their MIDI-Optimizer cables aren't limited in length, because they use fiber-optics instead of wires.

Less than one-quarter of the diameter of a normal MIDI cable, MIDI-Optimizers seem really thin and fragile, but they're really no more susceptible to destruction than an ordinary cable. We were concerned about whether bending the cable over on itself would permanently damage it; the manufacturer claims that, though the flow of data would be terminated in this condition, once straightened out the cable would work normally again.

Unlike standard MIDI cables, in which the two ends are interchangeable, MIDI-Optimizers can only conduct data in one direction. At one end is the optical transmitter, and at the other is the receiver; although these plugs are longer than standard MIDI plugs, they terminate in the familiar five-pin DIN connector.

MIDI-Optimizer draws power from a MIDI out or thru connector — not the out or thru on the instrument that originates the MIDI signal, but the MIDI out or thru on the destination instrument. Connected to the receiver with a 1' wire is a supplementary MIDI connector that plugs into a MIDI out or thru on the destination device. This connector doesn't monopolize that out/thru, because it provides a piggyback MIDI jack (give a dog a bone) that will function as the out/thru. Of course, since Optimizers don't consist of wire, they won't be able to carry power for devices that require it over the MIDI line.

The 200' Optimizer we reviewed worked perfectly well in our MIDI rig, even plugged into an Atari computer's non-standard MIDI out/thru. — *Mark Vail*

SHORT TAKES

about the DS-4P's weaknesses — fly-weight plastic box, not MIDI-compatible, no external triggering, no volume control, no center detent on the pitch slider, and so on — but as we mentioned above, this product wasn't designed to be a substitute for a professional sampler. It's a portable and easy-to-use sampling unit for record-spinning-types who don't own a sampler, a sampling deejay mixer, or a sampling digital effects unit. The unit works like a charm, but, considering its features, we think the $365 price tag is on the steep side. For nearly the same amount of money, you could hunt down a pre-owned Akai X7000, Ensoniq Mirage, or Roland S-10 sampler. Of course, those units won't fit in the palm of your hand or on top of a deejay mixer, but do they offer a keyboard, a disk drive, and significantly more editing capabilities. Don't sell the DS-4P short, though. If you're willing to make the tradeoff in fidelity, you can get up to 80 seconds of sample time — way more than any of the above (and the DS-4P is much faster and easier to operate). If ease of use and portability are your main concerns, the DS-4P is an attractive option. If sample editing is important to you, then check the classifieds. — *Greg Rule*

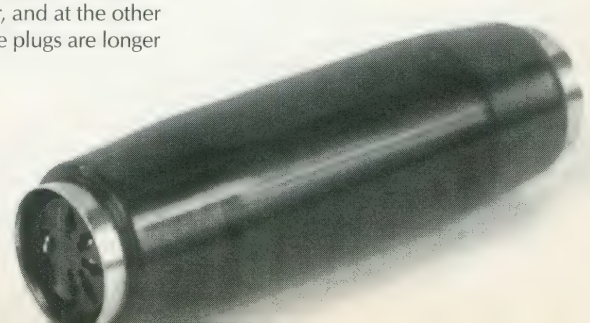
EYE & I MERGER PLUS AND MIDI CRYSTAL IN-LINE MIDI SIGNAL INDICATOR

Merger Plus: $99.95. **MIDI Crystal:** $19.95. Eye & I Productions, 930 Jungfrau Ct., Milpitas, CA 95035. (408) 945-0139. Fax (408) 945-5712.

Merger Plus: *Pros:* Panic button. Derives power over MIDI cable. *Cons:* Lighter than the MIDI cables you connect to it.

MIDI Crystal: *Pros:* Indicates MIDI signal present. Derives power over MIDI cable. *Cons:* Female connector at both ends.

SOMETIMES THE MOST IMPORTANT addition to a MIDI rig is a simple little utility box. Canadian manufacturer Anatek was founded on that premise, and their line of Pocket Products is sprinkled throughout the MIDI community. Now a California com-



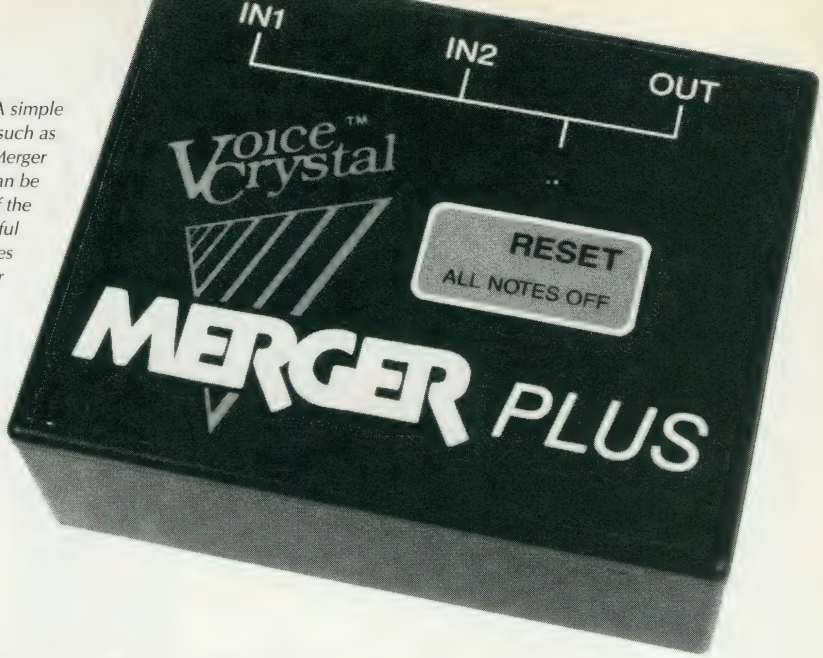
Ever wonder whether MIDI signals are reaching all parts of your MIDI rig? The MIDI Crystal is an inexpensive way to verify MIDI transmission.

pany, long-time third-party sound developer Eye & I Productions, has dipped its toe into the utility-box pond by introducing a pair of items, a MIDI merger and a MIDI signal indicator.

Their Merger Plus goes head to head with Anatek's Pocket Merge ($109, reviewed Aug. '89). Both will merge signals from any two MIDI sources into a single MIDI data stream. Merger Plus also offers the extra benefit of an on-board panic button. This will silence stuck notes on any synth, because not only does it transmit an all-notes-off message for each MIDI channel, it also sends note-offs for every note on every MIDI channel. It also sends a sustain-pedal-off message for each channel.

Merger Plus, which draws power through its first MIDI in, worked flawlessly in our setup, successfully mixing multitrack sequence data with wicked strings of notes from our arpeggiator. We were able to download a sys-ex dump from our synth to our computer with no trouble. Merger Plus provides a buffer for any other incoming data, giving priority to the sys-ex dump. The sequence we were playing was briefly interrupted during the dump, but it continued afterward with no errors.

We wouldn't have fulfilled our journalistic duty if we couldn't find something bad to say about Merger Plus, so here it is: It's so lightweight that by the time you plug three MIDI cables in, it doesn't want to sit level on the surface that supports it. Once you get it balanced, the little rubber feet that it comes with help keep it from sliding around. In addition, we really appreciate the eight application diagrams provided in Merger Plus's manual.



A simple box such as the Merger Plus can be one of the most useful utilities in your MIDI rig.

Not all synth modules provide MIDI data present indicators. Insert Eye & I's MIDI Crystal in-line between such a product and your MIDI source, and you'll see whether data is actually coming down the MIDI cable. This can also help you weed out non-functioning MIDI cables. MIDI Crystal terminates in a female MIDI connector at both ends; thus you'll need two MIDI cables to incorporate the product into your system. For some applications, it would have been more convenient if one end was a male connector. Like Merger Plus, MIDI Crystal draws power — a small fraction of what's available — over the MIDI cable it's connected to.

— *Mark Vail*

DEBBIE GREENBERG

OPCODE PRODUCTS (MACINTOSH). Opcode has released Audioshop, an 8-bit digital audio editing and management program. Digitized sounds and/or tracks from audio CDs (using a CD-ROM drive) can be assembled into a collection of tracks called a playlist. The program, which is not copy-protected, includes two disks of music and sound effects. New sounds can be recorded using the built-in microphones on newer Mac models or using other input devices such as MacRecorder. Digital audio tracks are played direct from disk to maximize memory availability. Users can edit a digital audio track, change the sequence of tracks, and access any track with the find function. Audioshop, which also allows editing of audio from a Quicktime movie, can load and save digital audio tracks in a variety of formats. Opcode's Studio 4 is a 128-channel 8-in/8-out MIDI and SMPTE interface for the Macintosh. As a MIDI interface, the Studio 4 allows the Mac to communicate independently with each of eight MIDI ins and outs, each with 16 channels, for 128 MIDI channel compatibility. Up to four Studio 4s can be used together for up to 512 MIDI channels. As a synchronizer, the unit can convert SMPTE into MIDI time code, and has the ability to read and write SMPTE code in all formats. Studio 4 comes with Opcode MIDI System (OMS), which allows the user to describe a MIDI studio's connections, devices, channels, controllers, etc. With Studio 4 and a Mac, OMS can add MIDI filtering, channelization, note-range splitting, controller mapping, and velocity and control value modification. Audioshop: $89.95. Studio 4: $495.00. Opcode Systems, 3950 Fabian Way, Ste. 100, Palo Alto, CA 94303. (415) 856-3333. Fax (415) 856-3332.

MIDICONCEPTS SEQUENCER (IBM-PC). EZ MIDI Pro is a 128-track sequencer with pull-down menus, mouse support, and the ability to use EMS and XMS memory for song storage. In addition to programmable faders for real-time manipulation of MIDI controllers, the software supports up to four MIDI ins and eight MIDI outs, depending on the MIDI interface being used. Other features include sync to SMPTE and MIDI time code, SMPTE hit-point calculator, support of MIDI files, and the ability to edit notes and controllers on the same screen. $149.00. MIDIconcepts, 2253 Chesterton Dr., Simi Valley, CA 93063. (805) 582-1591. Fax (805) 582-2507.

COMMUNITY LOUDSPEAKER. Community's N-series FB Fatboy loudspeaker utilizes a three-way design with a long-excursion subwoofer component for bass response. The Fatboy, which weighs 75 lbs. and measures 26-1/2" x 18-1/4" x 14-1/2", produces frequencies between 45Hz and 18kHz, generates 124dB of maximum continuous SPL at one meter, and has an impedance of 8 ohms. The Fatboy can be bi-amped or operated as a passive three-way system. $1,340.00. Community Light & Sound, 333 E. Fifth St., Chester, PA 19013. (215) 876-3400.

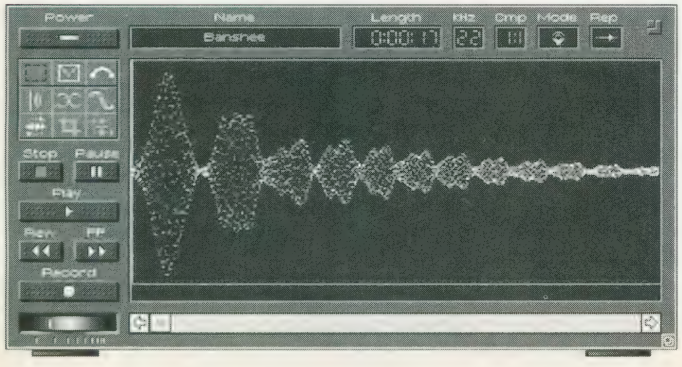
CIRCA SOFTWARE (IBM-PC). Circa Industries' Orpheus version 2.0 sequencing software has quick-key editing, help-message disabling, and graphical-editing macros. Hints are provided with all pull-down menus, and on-line help facilities and a search function are also available. The software imports and exports standard MIDI files. Each track can record unlimited overdubs. In addition to displaying performances in both event-list and graphic piano-roll formats, Orpheus can be configured for specific recording tasks. Other features include event-selection tools, editing functions, MIDI data analysis, and support for all MPU-401 and compatible MIDI interfaces. The software is available from your local MIDI BBS and to any MIDI BBS Sysops at no charge, or direct from Circa for $5.00. Users can register their software for $50.00. Circa Industries, Box 3751, Reston, VA 22090. (703) 435-5628. Fax (703) 435-9533.

G.H.S. SYBIL (IBM-PC, MACINTOSH). G.H.S. has released version 3.0 of Sybil real-time performance software for the IBM-PC and Macintosh. New features include real-time looping, a four-voice harmonizer/channelizer, microtonal pitch-shifting, and a set of wild-card toggles. A song-file toggle allows up to four multitimbral songs or motifs to be played back from any note one step at a time. The new version can also record live performances and save them in MIDI file format. $225.00. G.H.S. Music Products, 2813 Wilber Ave., Battle Creek, MI 49015. (800) 388-4447. (616) 968-3351. Fax (616) 968-6913.

INVISIBLE EQUIPMENT STAND. Invisible Product's Lightnin' is a single-tier stand for full-size keyboards, rack equipment, and speakers. The lightweight, fully assembled, all-steel stand features a tension design that eliminates knobs, nuts, and locks. Its chain-link height adjuster/tensioner provides 17 height settings between 22" and 36". The unused portion of chain can be stored inside the support tubes. Lightnin', which supports 125 pounds, offers an angled profile for adequate leg room, includes a 10-year warranty, and will support shelves, DJ coffins, and mixing boards. $79.00. Invisible Products, Box 350, Newtonville, MA 02160-0350. (617) 969-8400. Fax (617) 332-5461.

PINNACLE SOFTWARE (NEXT). Pinnacle Research has released Presto sequencing and DSP synthesis software for the NeXT. Features include an intuitive graphical interface, drag-and-drop measure editing, and multi-document support that allows the user to simultaneously edit multiple files and transfer data between them. Presto, which can read and write standard MIDI files and NeXT Score and Playhouse file formats, also transmits MIDI real-time clocks. The software provides a library of DSP sounds, such as piano, electric bass, strings, voice, woodwinds, and percussion. Note and MIDI controller editing can be performed graphically or with the event-list editor. Quantize, transpose, velocity adjust, and time-shift functions are included, as well as a randomize option for humanizing sequenced passages. $295.00. Pinnacle Research, 4725 E. Sunrise Dr., #435, Tucson, AZ 85718. (602) 529-1135.

WERSI PRODUCTS. Wersi's Z-One Masterboard controller offers four MIDI ins and four MIDI outs for 64 channels of MIDI control,



and a weighted 88-note hammer-action keyboard. Eight independent MIDI zones can be defined per MIDI channel, with up to 18 functions per zone. Fully programmable MIDI merging on all 64 channels combines with four programmable sliders and two programmable control wheels, each with eight programmable functions per destination per preset. The Z-One offers storage of up to 64 user presets, as well as RAM card expansion. Wersi has also announced the VEX-60 live expander, which has 54-voice polyphony, 24-bit digital signal processing, 18-bit stereo digital-to-analog converters, and 10Mb of pop/rock, orchestral, and ethnic instruments. Other features include a 44.1kHz sample-playback rate, digital filters, eight programmable polyphonic outputs, and mappable drum sounds. Z-One: $2,799.00. VEX-60: $1,795.00. Wersi, 1818 Elm Hill Pike, Nashville, TN 37210. (615) 871-4500. Fax (615) 889-5509.

CODA MUSICPROSE FOR WINDOWS (IBM-PC). Coda's MusicProse notation software is now compatible with Microsoft Windows 3.0 and 3.1, and supports most input and output devices, including the Roland MPU-401 and compatibles, IBM Music Feature card, Yamaha C1, and the Sound Blaster and Sound Blaster Pro. The software, which can transpose music into any key, allows users to create scores with up to 32 staves (each with multiple voices), to capture, transcribe, and display notes on-screen in standard notation, and to enter music data with a mouse, with a keyboard, or by importing standard MIDI files. Coda is also shipping an Academic Edition of MusicProse for Windows for purchase by schools, teachers, and college students. MusicProse for Windows: $249.00 (price can be applied toward the future purchase of Finale). Academic Edition: $175.00. Coda Music Software, 1401 E. 79th St., Bloomington, MN 55425-1126. (612) 854-1288. Fax (612) 854-4631.

A.R.T. EQUALIZERS. A.R.T.'s High Definition Series Equalizers include the HD-15, a stereo 2/3-octave, and the HD-31, a stereo 1/3-octave. Both HDs offer long-throw sliders, relay bypassing, flexible signal-present/clip indicators, and filter networks that don't allow center-point drift. The equalizers feature active balanced inputs and outputs, 15dB of cut and boost, a maximum input level of +24dBm, and reported THD of less than .005%. $425.00 each. Applied Research & Technology, 215 Tremont St., Rochester, NY 14608. (716) 436-2720. Fax (716) 436-3942.

EVENTIDE ULTRA-HARMONIZER. Eventide's H3500 Dynamic Ultra-Harmonizer features pitch-shifting, dynamic effects, and audio production tools such as sampling, delay, flanging, chorusing, reverb, phasing, and sound effects. The unit's 18 digital-processing algorithms include Mod Factory 1 and Mod Factory 2, which are responsible for an array of DFX dynamic effects ranging from straightforward compression and ducked delays to touch-sensitive choruses and reverbs and beat-per-minute-calibrated delays and loops. The H3500 is configured with either 11.8 seconds of stereo (23.7 seconds mono) or 47.5 seconds of stereo (95 seconds mono) 16-bit sampling at 44.1kHz. Both versions offer capabilities such as pitch change without changing playback length and playback time change without changing pitch. Sample memory can be accessed via the delay loop presets in Mod Factory mode. Short version: $3,495.00. Long version: $4,495.00. Eventide, 1 Alsan Way, Little Ferry, NJ 07643. (201) 641-1200. Fax (201) 641-1640.

WESTONE EARPLUGS. Westone's ER-25 Musicians Earplugs have 10dB more attenuation than their ER-15 earplugs. With both models, the fidelity of the sound is reportedly preserved; music levels are attenuated with a minimum change of tone quality. The ER-25 should be used where sound levels regularly exceed 105dB. ER-15 owners can purchase the ER-25 attenuator buttons for added protection, but new earmolds are not needed. Prices range from $120.00 to $140.00. Westone Labs, Box 15100, Colorado, Springs, CO 80935. (800) 525-5071.

TIME DESIGNS MIDI METRONOME. The Midinome is a fully programmable visual metronome that displays tempos, time signatures, meter changes, ritards, and other user-programmable visual timing references. Features include a MIDI input for transforming MIDI clocks and note on/off information into a visual timing display, a MIDI thru for linking Midinomes together, and a row of 13 LEDs. A large-flash LED displays the strong pulses of a measure. The unit, which measures 2.5" x 8" x 6.25" and weighs 3 lbs., also offers an internal clock of 40-250 beats per minute and an upgradable EPROM. $249.00. Time Designs, 2854 Baton Rouge Ct., San Jose, CA 95133-2001. (408) 258-1460. Fax (408) 246-3706.

KAWAI PRODUCTS. Kawai has introduced the FS730, a touch-sensitive keyboard with 100 PCM sounds that range from piano, violin, and strings to electronic, percussive, and woodwinds. Rhythms include modern and classical accompaniments from jazz and bluegrass to Latin and funk. Kawai has also announced the FS780 and FS750 dynamic-touch keyboards with 100 16-bit PCM sounds and 100 PCM rhythms. Both keyboards offer four styles of auto-accompaniment, five multitimbral MIDI channels, 32,400 dual sound variations, and Pattern Maker for creating and storing five personalized automatic accompaniments. The FS780's real-time recorder can play back up to 3,500 notes of music distributed across three songs, while the FS750 has a 500-note single-song recorder. The FS780 also includes 20-memory registration and a joystick for controlling pitch-bend. All three keyboards also feature one-finger ad-lib, 61 full-size keys, and built-in stereo speakers. FS730: $299.95. FS780: $479.95. FS750: $379.95. Kawai, 2055 East University Dr., Compton, CA 90224. (310) 631-1771. Fax (310) 604-6913.

OKTAL PRODUCTS (ATARI, IBM-PC, MACINTOSH). Oktal has announced Multitude Jr. 1.0 sequencing software, which has a resolution of 768 ppq, on-line help, and up to 256 tracks and 80 MIDI channels. In addition to real-time controller remapping, fade in/out velocity, and grid, drum, tempo, and song editing, the software features on-screen faders for continuous-controller data, up to 99 selective undo buffers, and the ability to edit during playback and recording. Multitude Pro 1.0 includes all of the features of Jr. 1.0, but adds real-time drum remapping, remote control of sequence looping, MIDI machine control, automatic sequence and backup saving, and sync to MIDI, MTC, and human tempo. Oktal's Multitude Pro/Score, which has the same specs as Pro 1.0, offers real-time note transcription, a WYSIWYG display, text importing, and score tabulation. The program, which can print a selected stave or a selected page, also features automatic beaming, support of all clefs, quantize display only, page preview, and bar numbering. Multitude Jr. 1.0: $149.99. Multitude Pro 1.0: $395.00. Multitude Pro/Score 1.0: $595.00. Oktal, Siege Social, 315 René-Lévesque Est, Bureau 110, Montréal, Québec, Canada H2X-3P3. (514) 844-3428. ■

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Feb. '86 Do-it-yourself Software, 1st Electronic Film Score, Nick Rhodes.
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1988
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Dec. '88 Bon Jovi's David Bryan, John Tesh Record, Fats Waller, M1 Clinic.

1989
Jan. '89 Third-party Sounds, Corea & LaVerne Record, Elton John Solo.
Feb. '89 Randy Newman, Billy Taylor, Practicing, Art Of Noise.
Jul. '89 Mike + The Mechanics' Paul Carrack and Adrian Lee, FZ1 Clinic.
Aug. '89 Howard Jones & Keith Emerson, How To Buy Your First Synthesizer.
Nov. '89 Rolling Stones' Keyboardists, Multi-Effects User's Guide, Chuckii Booker.
Dec. '89 Laurie Anderson, Multi-Effects Buyer's Guide, Margaret Leng Tang.

1990
Feb. '90 Vince Clarke of Erasure, Programming The K1000, Tony Banks, Korg T1.
Apr. '90 Tears For Fears, Tony Hymas, Atari ST Clinic, Nine Inch Nails.
May '90 Jam And Lewis, The Future Of MIDI, "Blue" Gene Tyranny, Yamaha SY77.
Jun. '90 Jane Child, Amiga Multimedia Tools, Harry Partch, Passport Encore.
Jul. '90 Jonathan Cain, Mixer Shootout, Gershwin Meets MIDI, Ryuichi Sakamoto.
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1991
Jan. '91 Prince's Keyboardists, Opcode Studio Vision, Roland S-550/330 Clinic.
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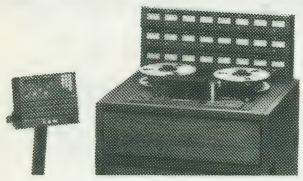

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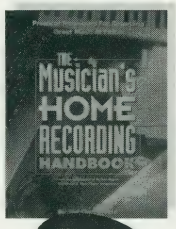

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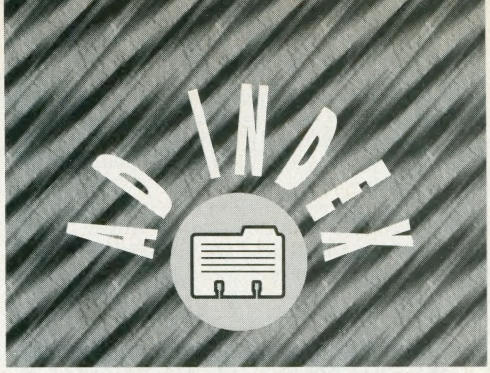

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